



CONTRACT REPORT
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**Improving Effectiveness of Bioremediation at DNAPL
Source Zone Sites by Applying Partitioning Electron
Donors (PEDs)**

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May 2014

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FINAL TECHNICAL REPORT

Improving Effectiveness of Bioremediation at DNAPL Source Zone Sites by Applying Partitioning Electron Donors (PEDs)

ER-0716

May 2014

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LIST OF ACRONYMS

1,1,1-TCA	1,1,1-Trichloroethane
ADR	advective-dispersive-reactive
AFCEE	Air Force Center for Engineering and the Environment
ASTM	American Standard for Testing and Materials
BTC	breakthrough curve
CCAFS	Cape Canaveral Air Force Station
cDCE	cis-1,2-Dichloroethene
CFC113	1,1,2-Trichloro-1,2,2-trifluoroethane
CMS	Corrective Measures Study
cm/sec	centimeters per second
DEM/VAL	demonstration/validation
<i>Dhc</i>	<i>Dehalococcoides</i>
DHG	dissolved hydrocarbon gas
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DoD	Department of Defense
DoT	Department of Transportation
DPT	direct-push technology
DQI	data quality indicator
DSZ	DNAPL source zones
EDS	Environmental Drilling Services, Inc.
EISB	enhanced in situ bioremediation
ESB	Engineering Support Building
ESTCP	Environmental Security Technology Certification Program
EVO	emulsified vegetable oil
EXWC	Expeditionary Warfare Center
FDEP	Florida Department of Environmental Protection
f_{oc}	fraction of organic carbon
ft	feet
ft ²	square feet
ft BLS	feet below land surface
ft/day	feet per day

LIST OF ACRONYMS cont'd

GAC	granular activated carbon
gal	gallons
GCTL	Groundwater Cleanup Target Level
gpm	gallons per minute
GT	Georgia Institute of Technology
HCP	high concentration plume
HSA	hollow stem auger
IDW	investigation derived waste
IMWP	Interim Measure Work Plan
ITRC	Interstate Technology Regulatory Council
k	coefficient
KBr	potassium bromide
kg	kilogram
kgal	kilo gallons
KI	potassium iodide
K_{nw}	NAPL:water partitioning coefficient
K_{oc}	organic carbon partition coefficient
KSC	Kennedy Space Center
lb	pound
LC34	Launch Complex 34
LCP	low concentration plume
LCS/LCSD	laboratory control sample/ laboratory control sample duplicate
LOX	liquid oxygen
MCL	maximum contaminant level
m/day	meters per day
MEL	methanol-ethanol-lactate
mg/kg	milligram per kilogram
mg/L	milligrams per liter
MIP	membrane interface probe
mmol C/L	millimole equivalents of carbon per liter
MS/MSD	matrix spike/ matrix spike duplicate
NADC	Natural Attenuation Default Concentrations
NAPL	non-aqueous phase liquid
NASA	National Aeronautics and Space Administration

LIST OF ACRONYMS cont'd

NAVFAC	Naval Facilities Engineering Command
NAFVAC ESC	NAVFAC Engineering Service Center
NAVFACSW	NAVFAC Southwest
nBA	n-Butyl acetate
nBuOH	n-Butanol
nHEX	n-Hexanol
NPV	net present value
O&M	operation and maintenance
ORP	oxidation reduction potential
PARCCS	precision, accuracy, representativeness, comparability, completeness, & sensitivity
PCE	Tetrachloroethene
PE	polyethylene
PED	partitioning electron donor
P&ID	process and instrumentation diagram
QA/QC	Quality Assurance / Quality Control
RCRA	Resource Conservation and Recovery Act
R _F	retardation factor
RFI	RCRA Facility Investigation
ROI	radius of influence
RPD	relative percent difference
RTDF	The Remediation Technologies Development Forum
SABRE	Source Area BioREmediation
SOP	Standard Operating Procedure
TCE	Trichloroethene
tDCE	<i>trans</i> -1,2-Dichloroethene
TDS	total dissolved solids
TDP	Technology Demonstration Plan
TOC	total organic carbon
TVOC	total volatile organic compounds
UIC	underground injection control
USEPA	United States Environmental Protection Agency

LIST OF ACRONYMS cont'd

VC	Vinyl chloride
<i>vcrA</i>	vinyl chloride reductase
VFA	volatile fatty acid
VOC	volatile organic carbon
yd ³	cubic yard
μg/L	micrograms per liter

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Contact information for the key team members are provided in Appendix A.

Executive Summary

Introduction

Enhanced In situ bioremediation (EISB) can be a low-cost approach for accelerating remediation timelines at sites impacted with dense non-aqueous phase liquids (DNAPLs) such as trichloroethene (TCE) and tetrachloroethene (PCE). EISB typically relies on the addition of electron donor formulations to enhance the rate of dissolution and reductive dechlorination. Although vegetable oil is a low cost electron donor, it is typically added in excess amounts to ensure that it is distributed effectively. It has been demonstrated by Harkness (2000) that the cost of electron donor can represent up to 50% of the net present value (NPV) cost when applied using passive (i.e., biostimulation) methods. Hence, the selection of electron donors has a major implication on EISB cost.

Achieving high rates of biologically-enhanced DNAPL dissolution requires that electron donors be delivered effectively to achieve concentrations at the DNAPL:water interface that will sustain the growth and activity of the dechlorinating biomass. Challenges with typical electron donors, such as lactate and emulsified vegetable oils (EVO) include that they are: (1) consumed as they migrate towards DNAPL source zones by non-dechlorinating biomass; and (2) result in the establishment of dechlorinating biomass in zones of dissolved DNAPL. This location can be too far away from the DNAPL to enhance its dissolution.

Partitioning electron donors (PEDs) are electron donors that partition directly into a target DNAPL. PEDs are water soluble, hence they are easily transported to a DNAPL source zone. This property aids in their mixing throughout the source zone and maximizes contact with the DNAPL. Even at high dose rates, PEDs are slowly metabolized, which facilitates delivery without significant loss and allows efficient distribution throughout the source zone. Additionally, PEDs partition strongly into DNAPL from which they are subsequently released, providing a high percentage of reducing equivalents that can be consumed in the reductive dechlorination process close to the DNAPL/water interface, and therefore promote establishing dechlorinating biomass at this interface.

Objectives

The objectives of the field demonstration/validation (DEM/VAL) included:

1. Demonstrate application of the PED technology at field scale, assess the ability to distribute PED within the source area and enhance biodegradation;
2. Validate the enhanced performance and efficiency of DNAPL dissolution and dechlorination following the injection of a PED.
3. Collect cost and performance data for the application of PEDs for source zone bioremediation and provide reliable technical data relevant to field-scale implementation of

the PED technology, including documentation of the expected reduction in duration and cost of remediation of DNAPL source sites.

A number of qualitative and quantitative performance objectives were established in order to assess the effectiveness of the amendment and are discussed in detail in Section 3.

Technical Approach

Laboratory treatability studies were conducted to evaluate candidate PEDs for eventual field application as part of the project. Based on prior research, consideration of physical-chemical properties, material costs, and toxicity, two candidate PEDs, n-butyl acetate (nBA) and n-hexanol (nHEX), were selected for laboratory evaluation for enhanced microbial reductive dechlorination of TCE-NAPL. The experiments, conducted by Georgia Tech, included: (i) PED-NAPL Partitioning Studies to assess key physical-chemical parameters that are important for successful field implementation and included liquid-liquid equilibrium batch studies and mass transfer column experiments (abiotic columns); and (ii) Bench-Scale Treatability experiments to obtain site-specific design parameters for PED delivery, mass transfer, and enhanced microbial reductive dechlorination activity in a TCE-DNAPL source zone. These tests were designed to evaluate mass transfer of the partitioning electron donor and potential microbial activity under anticipated field conditions, and ultimately to demonstrate that the PED enhances reductive dechlorination activity and DNAPL dissolution rates. The results confirmed the strong partitioning of nBA into TCE-NAPL to support dechlorination. The results from these studies were summarized in a Final Treatability Tests report in February 2010 and published by Capiro et al., (2011).

During the treatability studies, the strong partitioning of nBA into TCE- and surrogate-NAPL suggested that a single injection of PED solution was capable of providing electron donor to support microbial reductive dechlorination far beyond the number of PVs delivered, thereby reducing the need for frequent or repeated PED injections. On this basis, nBA was selected as the PED for use in the bench scale biological treatability evaluation.

The PED technology field demonstration was conducted at a source zone (Hot Spot 1) at the National Aeronautics and Space Administration (NASA) Launch Complex 34 (LC34). At this site, TCE DNAPL is associated with a silty sand/silty clay horizon at about 42 to 48 feet below land surface (ft BLS) and TCE concentrations up to 141,000 micrograms per liter ($\mu\text{g/L}$) had been reported. The zone was amended with nBA above, within and below this low permeability horizon. In total, 34,000 gallons (gal) of nBA solution (3,000 milligrams per liter [mg/L]) was injected using direct-push technology (DPT). The solution volume was selected to be approximately 50% of the total pore volume of the target zone. The amendment zone targeted the center of the Hot Spot 1 area, where TCE concentrations were greatest, roughly corresponding with the area enclosed by the 30,000 $\mu\text{g/L}$ TCE isopleth and extending beyond that by approximately 5 feet (ft) in all directions.

One or more conservative tracers were added to all PED injection fluids. Bromide was used as a conservative tracer in all injection fluids, to provide an indicator of amended fluid; the concentration of bromide would indicate the proportion of injectate in any sample. Iodide was added as a tracer only in the injection fluids introduced above the confining silty clay horizon. The iodide was used to monitor for potential migration of fluid from the upper treatment zone through the clay to the lower zone, which could have occurred as a result of maintaining a lower hydraulic head in the lower zone.

Two sweep zones, one above and one below the clay horizon were separately instrumented and operated, providing two data sets with which to evaluate the performance of the PED technology. Each sweep zone was instrumented with a single central extraction well, from which integrated groundwater samples were collected routinely to monitor the average concentration of various dissolved constituents over time. The groundwater extraction system was operated using solar power. Extracted groundwater was returned to the aquifer through a set of ten groundwater injection wells on the perimeter of the TCE plume. At each of five injection locations, a pair of injection wells was installed, above and below the clay horizon, to help create an inward hydraulic gradient and promote horizontal flow across the top and base of the clay horizon.

Each extraction well operated, at a relatively low flow rate, to maintain an inward hydraulic gradient and collect representative groundwater from the aquifer on either side of the clay horizon. The extracted groundwater was analyzed for volatile organic carbons (VOCs) to establish the baseline flux of VOCs. Once stable baseline conditions were established, the demonstration area was amended with nBA and conservative tracers (bromide and iodide) using DPT injection to deliver the amendments throughout the target zone. This approach delivered the amendment solution throughout the pore volume of the plot all at once, rather than relying on advective transport in a recirculation mode, and allowed the amendments to be preferentially delivered to the clay layer and the portions of the overlying and underlying aquifers where residual DNAPL may be present. A shut-in period, with no groundwater extraction, of six weeks followed to allow the native microbes to acclimate to the nBA and for the biomass to become established within the demonstration area. Soil and groundwater samples were collected to establish the distribution of electron donor and tracer within each zone of the demonstration area prior to starting the groundwater recirculation.

Routine groundwater samples were collected during recirculation to assess the concentrations and flux of various compounds. Comparison of concentrations (VOCs, PED, tracers) in groundwater initially and over time extracted from the central wells were used to assess the “disturbance effect” of direct injection and evaluate the quantity of nBA that was taken up by the DNAPL, sorbed or diffused into secondary porosity of the formation (where the non-aqueous phase liquid [NAPL] also likely resides). Trends in the concentrations of various dissolved constituents in extracted water over time were used to understand changes in the flux of VOCs (and amended compounds). Soil sampling was conducted before (baseline delineation) and after the demonstration area was amended, to establish mass distribution within the plots, and again

after operation was halted, to assess changes over the DEM/VAL operation and correlate these results with the observed trends in groundwater concentrations.

Both sweep zones were monitored throughout the course of the demonstration, to evaluate system performance and evaluate whether laboratory assessment data are useful to predict PED performance under field conditions. The performance was assessed in terms of VOC mass flux enhancement and compared with previous studies using typical, non-partitioning, soluble electron donors such as lactate.

Results

The performance objectives of the DEM/VAL were met. nBA, was successfully introduced to the source area using readily available direct-push injection equipment, with a few extra precautions (e.g. bonding and grounding) for handling the pure nBA. The PED was able to promote biodegradation and achieved sustained production of dechlorination products, even in the presence of 1,1,2-Trichloro-1,2,2-trifluoroethane (CFC113), which was a co-contaminant in the demonstration area. *Dehalococcoides (Dhc)* numbers increased. Donor longevity was assessed and donor was present (as total organic carbon [TOC] and volatile fatty acids [VFAs]) up to one year following PED injection. Even with groundwater extraction the donor concentrations were sustained well beyond the point where initial injectate volume was extracted. Tests confirmed that the PED was capable of partitioning into a TCE DNAPL.

Overall, nBA was demonstrated to be a suitable electron donor for source areas. The application was completed using conventional direct-push injection equipment. Geosyntec continues to work with commercial vendors to develop off-the-shelf PEDs that are pre-mixed for ease of application. The use of PEDs for source zone bioremediation is expected to be cost-equivalent to emulsified vegetable oil applications. Donor longevity of nBA was at least equivalent to emulsified vegetable oil applications for similar applications.

The data collected over the study indicated that over the course of extracting two pore volumes that there was an increase in DNAPL dissolution rate as evident from the mass flux of total VOCs observed at the central extraction well. Furthermore, this increase in mass flux was greater than what is typically observed in applications using soluble donor. The shift in the parent:daughter breakdown product ratio over time showed that the breakdown products made up the majority of the total VOC mass flux. The increase in mass flux and increased proportion of breakdown products indicated that there was a source of the parent VOCs in the demonstration area (i.e., residual NAPL), and that there was enhanced dissolution of the source material that was made possible by maximizing the concentration gradient between the sorbed/DNAPL VOCs and water phase.

Time-trend data for the electron donor concentrations was also monitored and compared. Donor concentrations in conjunction with dechlorination product concentrations indicated the extent of sustained biological activity. Results using nBA were compared to those from tests that used soluble donors, such as lactate; the nBA provided a longer period of activity, since it partitioned

into residual NAPL initially and then gradually became re-supplied to groundwater whereas any unused soluble donor would have migrated away from the NAPL source area.

The costs to implement the PED technology for DNAPL source zone treatment will vary from site to site, depending on the size of the site (i.e., impacted volume) and several site-specific characteristics. A cost comparison was made between the PED technology and the most comparable in situ source zone treatment technology, conventional source zone bioremediation using emulsified vegetable oil (EVO). A hypothetical site was assumed to have the following characteristics:

- Sand aquifer (30% porosity) that is 30 ft deep and underlain by a clay aquitard;
- DNAPL source zone is 40 ft wide by 80 ft long by 15 ft deep (15 to 30 ft bgs); and
- 500 kg of TCE DNAPL is present

The calculated costs assume that the DNAPL and Site were previously well characterized. The total cost using PED as the electron donor was estimated to be \$571,000, while the total cost using EVO was estimated to be \$679,000. The differences in overall cost are attributable to the cost of donor applied in each event (which is a function of the unit cost and amount of donor required; the estimated number of applications is the same in both cases) and the duration of the remedy, which governs the number of monitoring events.

Limitations

The main limitations of using the PED technology are:

- Requires characterization - Similar to any source remediation technology, understanding and identifying of the extent of the source zone is required to estimate the DNAPL mass present and thereby, minimize the zone to be treated. Such an effort would require capital cost expenditures; and
- Site characteristics - Sites lacking suitable microorganisms to ferment the PED and/or sites that have certain geochemical conditions that inhibit biodegradation of target VOCs will require bioaugmentation and/or additional remedial measures.

Benefits

As with all source treatment technologies, delivering the PED into the source area is critical. The nBA was applied to the treatment zone with conventional direct push injection technology. This project showed that the selected PED, nBA, can; (1) achieve high rates of biologically-enhanced DNAPL dissolution; (2) be easily and effectively delivered; and (3) sustain donor supply at an effective concentration at the DNAPL:water interface to promote the growth and activity of the dechlorinating biomass. The PED was water soluble, easily transported to a DNAPL source zone, and less expensive to deliver than other commercial products.

1. INTRODUCTION

1.1 BACKGROUND

EISB can be a low-cost approach for accelerating remediation timelines at sites impacted with DNAPLs such as TCE and PCE. Compared to other remedial techniques, the estimated cost reported from McDade et al. (2005) for ISB was \$29 per cubic yard (yd^3), in comparison to \$88 per yd^3 for thermal treatment, \$125 per yd^3 for chemical oxidation and \$385 per yd^3 for surfactant enhanced removal, respectively. McDade et al. also indicated that the lower cost for in situ bioremediation was “related to the cheaper unit cost of enhanced bioremediation amendments (electron donor).” Vegetable oil, a low priced electron donor, costs approximately \$1.00 per pound (lb). Yet, although the purchasing cost is economical, the amount of electron donor applied at impacted sites greatly affects the cost and efficacy of conducting EISB. It has been demonstrated by Harkness (2000) that the cost of electron donor can represent up to 50% of the NPV cost when applied using passive (i.e., biostimulation) methods.

To achieve high rates of biologically-enhanced DNAPL dissolution, electron donor needs to be delivered, as well as sustained at an effective concentration at the DNAPL:water interface for the growth of and consumption by dechlorinating biomass. Electron donors such as lactate and EVO are consumed as they migrate towards DNAPL source zones (DSZ) by non-dechlorinating biomass. In heterogeneous geological formations containing DNAPL pools and ganglia, there’s uncertainty on the efficacy of aqueous and emulsified electron donors; i.e., will the electron donor be present at the DNAPL:water interface with a concentration appropriate to achieve maximum biodegradation rates and dissolution effects. As indicated by a Department of Defense (DoD) protocol funded by Environmental Security Technical Certification Program (ESTCP) (Air Force Center for Engineering and the Environment [AFCEE], et al., 2004), typical electron donor applications have only 1 to 10% efficiency. Hence, typical applications have accounted for the loss of reducing equivalents with the addition of a five to ten times the amount of electron donor required as a safety factor. Adding high concentrations of electron donor may overcome these limitations by allowing higher concentrations of electron donor to reach the DNAPL:water interface; however, this increases the application cost significantly.

PEDs are electron donors that partition directly into a target DNAPL. PEDs are water soluble, hence they are easily transported to a DNAPL source zone. This property aids in their mixing throughout the source zone and maximizes contact with the DNAPL. Additionally, PEDs partition strongly into DNAPL from which they are subsequently released, providing a high percentage of reducing equivalents that can be consumed in the reductive dechlorination process.

1.2 OBJECTIVE OF THE DEMONSTRATION

The objectives of this field DEM/VAL were to:

1. Demonstrate application of the PED technology at field scale, assessing the ability to distribute PED within the source area and enhance biodegradation;
2. Validate the enhanced performance and efficiency of DNAPL dissolution and dechlorination following the injection of a PED; and
3. Collect cost and performance data for the application of PEDs for source zone bioremediation and provide reliable technical data relevant to field-scale implementation of the PED technology, including documentation of the expected reduction in duration and cost of remediation of DNAPL source sites.

The field DEM/VAL was conducted at the National Aeronautics and Space Administration (NASA) LC34, located on Cape Canaveral Air Force Station (CCAFS), Cape Canaveral, Florida. A TCE source area, designated as Hot Spot 1, was identified as separate and distinct from the VOC mass beneath the Engineering Support Building (ESB). This site had a TCE-NAPL source that appeared primarily to exist within/near a lower conductivity unit. Site conditions were appropriate and a suitable on-site support network existed for execution of the DEM/VAL.

1.3 REGULATORY DRIVERS

The United States Environmental Protection Agency (USEPA) maximum contaminant level (MCL) for PCE and TCE in drinking water is 5 µg/L. This concentration is considerably less than the concentrations present in groundwater at many sites throughout the United States. The MCLs for vinyl chloride (VC) and cis-1,2-dichloroethene (cDCE) are 2 µg/L and 70 µg/L, respectively. A significant number of sites have VOCs present as free-phase DNAPLs that will act as long-term sources of VOCs to groundwater. In situ technologies for treatment of these contaminants often focus on the groundwater plume and not the source of contamination. Due to the slow dissolution of VOCs from residual or pooled DNAPL source areas, as well as the slow diffusive release of VOCs from low permeability materials (i.e. back-diffusion), conventional treatments serve solely as containment technologies and require long operational periods to remove significant amounts of DNAPL. Therefore, this demonstration sought to demonstrate and validate a more cost-effective technology to remediate DNAPL source areas and meet these regulations.

2 TECHNOLOGY

The following sections provide an overview of the technology (Section 2.1) and a discussion of the potential advantages and limitations of the technology (Section 2.2).

2.1 TECHNOLOGY DESCRIPTION

Previous studies have demonstrated that many chloroethene-dechlorinating microbial species can tolerate high VOC concentrations (Interstate Technology Regulatory Council [ITRC], 2005; Amos et al., 1997). The location of the dechlorinating biomass relative to the DNAPL:water interface is controlled by (1) toxicity effects of high chlorinated compound concentrations, and (2) the concentration profiles of both the electron donor and the dissolved phase VOCs coming from the DNAPL. When the electron donor and the dechlorinating microorganisms are near the DNAPL:water interface, high rates of biologically enhanced DNAPL dissolution can result.

The concentration profile of the electron donor is controlled by the rate at which it is consumed by native microbes relative to its transport rate by diffusion and advection processes. This results in the electron donor concentration being higher in the bulk water phase, and lower near the DNAPL:water interface. In contrast, the concentrations of dissolved phase chlorinated VOCs will be higher near the DNAPL and decrease away from the DNAPL:water interface. The electron donor and dissolved chlorinated VOC concentration profiles overlap, and the dechlorinating biomass will tend to occur at locations where these concentration profiles create the optimal ratio of electron donor to chlorinated VOCs. Biomass that forms too far away from the DNAPL:water interface will not produce significantly lower dissolved VOC concentrations near the interface where diffusion forces dominate mass transfer of the VOC from the DNAPL into solution.

PEDs are electron donors that partition directly into the DNAPL. The development of the PED approach is a combination of partitioning tracer and electron donor technologies. When PED encounters free-phase DNAPL, it partitions into the DNAPL with a corresponding decrease in its aqueous phase concentration. Depending on the method of PED addition (e.g., a pre-determined mass of PED that is injected in batches, or a constant or stepped concentration delivery scheme), different breakthrough concentrations of PED at the extraction will be observed over time. Analysis of the breakthrough will indicate when the DNAPL in the source area has taken up sufficient PED to achieve the target loading. Eventually, the DNAPL-phase PED will partition back into the groundwater and provide a much higher and sustained concentration of electron donor at the DNAPL:water interface than is achieved with existing electron donor delivery methods. The outcome is the promotion of dechlorinating biomass growth close to the DNAPL, which results in sustained enhanced DNAPL dissolution rates. This approach increases the efficiency of electron donor use for two reasons: (1) it avoids loss (i.e., microbial consumption) of donor as it migrates towards the DNAPL; and (2) it reduces the consumption of electron donor in microbial processes not associated with reductive dechlorination.

2.2 TECHNOLOGY DEVELOPMENT

Various ESTCP projects have provided significant information in the development of EISB and the application of electron donors and PED in DNAPL source areas. Experimental systems and analyses developed to study DNAPL biological dissolution (ER-0008), monitor the treatment of DNAPLs (ER-1293), demonstrate bioaugmentation (ER-9914), evaluate transport of microorganisms (ER-0315), and establish the benefits of DNAPL source zone treatment (ER-1293) have all contributed to the development of this technology. Bioenhanced dissolution was recognized as having the potential to accelerate depletion of source zone mass which would then reduce remediation timeframes and costs.

The use of PEDs was evaluated as part of The Remediation Technologies Development Forum (RTDF) Source Area BioREmediation (SABRE) program. The SABRE project compared six different electron donors, including nBA acetate and nHEX, two (2) soluble PEDs in addition to EVO, for their ability to treat DNAPL source areas. Microcosm results showed that these PEDs could support reductive dechlorination at aqueous TCE concentrations up to 400 milligrams per liter (mg/L). Both of these compounds had the potential to enhance dissolution rates.

As a precursor to the field DEM/VAL, laboratory treatability studies were conducted to evaluate two candidate PEDs, n-butyl acetate nBA and n-hexanol nHEX. This work was performed primarily at the Georgia Institute of Technology (GT) and funded by NAVFACSW. These studies are described in Section 5 of this report. The results suggested that nBA would be a suitable PED for field deployment. In water, nBA undergoes hydrolysis to form acetate and n-butanol. The n-butanol can then be utilized by fermenting organisms to produce butanoate, acetate, and hydrogen. Results of these evaluations were presented in detail in the Laboratory Treatability Study Report in February 2010 (NAVFAC ESC et al., 2010).

2.3 ADVANTAGES AND LIMITATIONS OF THE TECHNOLOGY

Groundwater remediation approaches at DNAPL sites historically employed groundwater extraction and *ex situ* treatment (i.e., pump-and-treat). Unfortunately, these approaches were demonstrated to be ineffective at significantly improving groundwater quality, even after decades of continuous operation (National Research Council, 1994). As a result, remediation technologies such as EISB have received significant attention, as government and industry struggle to develop remedial approaches for source treatment that are less intrusive, more effective, and less costly. The main advantages of the PED technology over other treatment technologies include:

- Cost – PEDs material is generally inexpensive;
- Reduced risk of mobilization - Predictable impact on DNAPL density or viscosity to mitigate the potential effects on DNAPL mobilization; and

- Safety - Non-toxic or generally regarded as safe for use in food products.

The main limitations of using the PED technology are:

- Requires characterization - Similar to any source remediation technology, understanding and identifying of the extent of the source zone is required to estimate the DNAPL mass present and thereby, minimize the zone to be treated. Such an effort would require capital cost expenditures; and
- Site characteristics - Sites lacking suitable microorganisms to ferment the PED and/or sites that have certain geochemical conditions that inhibit biodegradation of target VOCs will require bioaugmentation and/or additional remedial measures.

3 PERFORMANCE OBJECTIVES

The purpose of using a PED in place of a traditional soluble electron donor is to maximize the bioremediation efficiency and improve the DNAPL dissolution rate, while minimizing implementation costs associated with the application of EISB (primarily the cost of electron donors requiring repeated application) in DNAPL source zones. As such, the quantitative performance objectives discussed below were derived to assess the PED application impact on primary parameters such as increased DNAPL dissolution (i.e. increased total VOC mass flux) and reduction in DNAPL mass. It was assumed that the application of PEDs would cost much the same as conventional donors on a per-application basis (for example, delivery using direct-push injection), hence, if PEDs were effective longer (i.e., persisting longer results in less frequent donor amendment) and/or shorten remediation time frames, it would lower overall costs. The success criteria were thus not linked directly to the cost of application; rather, costs were evaluated to confirm that use of PED results in lower operation and maintenance costs by reducing the frequency of donor replenishment and decreasing treatment duration.

The quantitative performance objective success criteria were selected to provide reasonable and measureable goals that could be evaluated with the data collected. The criteria were intended to allow the partitioning behavior of the PED to be evaluated at this site. A number of the qualitative performance objectives were selected as possible effects of PED application that might be observed but were not necessarily required for a successful demonstration. These were generally secondary objectives that were evaluated as much as possible from the collected data.

The increase in total VOC mass flux (Quantitative Performance Objective 3.8) was anticipated to be the primary indicator that the PED was working as intended. The 50% improvement criteria was somewhat arbitrary, given the large number of factors that may have impacted the observed concentration profile, but provided a target that should be distinguishable from inherent variability in the data. Likewise, the reduction in DNAPL mass objective (Quantitative Performance Objective 3.9) was selected to provide a target (50% reduction in DNAPL mass) that could be discerned. Based on the expectation of increased dissolution of the DNAPL, resulting in shorter remediation times, a reduction in operation and maintenance costs was anticipated (Quantitative Performance Objective 3.10) and be quantified in the Cost & Performance Report. A value of 25% reduction was deemed appropriate as a target for cost reduction until actual implementation data are known.

The performance objectives are summarized in Table 1. Detailed descriptions of each performance objective are given in the corresponding sections below.

TABLE 1. PERFORMANCE OBJECTIVES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Performance Objective	Data Requirements	Success Criteria	Results
Qualitative Performance Objectives			
Ease of implementation (Section 3.1)	<ul style="list-style-type: none"> Feedback from field crew on handling and operating requirements for PED technology and time required (particularly in comparison to traditional soluble non-PED donor injection). 	<ul style="list-style-type: none"> PED amendment to the source area can be effectively achieved using readily available equipment. 	<p>Confirmed.</p> <p>PED was successfully introduced to the source area using readily available direct-push injection equipment, with a few extra precautions (e.g. bonding and grounding) for handling the pure nBA.</p>
Ability to promote biodegradation (Section 3.2)	<ul style="list-style-type: none"> Pre- and post-amendment VOC concentrations in groundwater. Microbial numbers. 	<ul style="list-style-type: none"> Increases in the concentrations of dechlorination breakdown products. Increases in the numbers of dechlorinating bacteria. 	<p>Confirmed.</p> <ul style="list-style-type: none"> Sustained production of dechlorination products, even in presence of CFC113. DhC numbers increased throughout both test plots.
Longevity of Electron Donor Supply (duration of remediation) (Section 3.3)	<ul style="list-style-type: none"> Time of operation compared to typical application of soluble non-PED donor. Concentrations of VOCs, nBA & n-butanol, lactate, VFA, TOC and DHG in groundwater. 	<ul style="list-style-type: none"> Supply of reducing equivalents is sustained for longer than a system using a non-partitioning donor, requiring less frequent donor amendment. 	<p>Confirmed.</p> <ul style="list-style-type: none"> Donor present (as TOC & VFAs) throughout 8 months (up to one year) following PED injection, declining over course of operation. Sustained well beyond the point where initial injectate volume was extracted.
PED partitions into the DNAPL (Section 3.4)	<ul style="list-style-type: none"> Conservative tracer (bromide), nBA & n-butanol concentrations in groundwater following amendment. 	<ul style="list-style-type: none"> Reduced concentrations of nBA relative to the conservative tracer in extracted groundwater following amendment, indicating uptake by residual DNAPL. Change in concentration should be proportional to mass of residual DNAPL present. 	<p>Confirmed.</p> <ul style="list-style-type: none"> Cápiro, N.L., Granbery, E.K., C.A. Lebrón, D.W. Major, M. McMaster, M.J. Pound, F.E. Löffler, K.D. Pennell. 2011. Liquid-Liquid Mass Transfer of Partitioning Electron Donors in Chlorinated Solvent Source Zones. Environ. Sci. Technol. 15;45(4):1547-54
PED partitions out of the DNAPL at a suitable rate and concentration (Section 3.5)	<ul style="list-style-type: none"> PED concentrations in groundwater following amendment. VFA & TOC concentrations in groundwater. 	<ul style="list-style-type: none"> Observe sustained concentrations of nBA (and products), sufficient concentrations of electron donor to promote dechlorination, and microbial dechlorination products in extracted groundwater. 	<p>Confirmed.</p> <ul style="list-style-type: none"> Sustained concentrations of electron donor (TOC and VFAs) were observed, with production of dechlorination products. Microbial numbers also increased.
Quantitative Performance Objectives			
Ability to deliver PED into the source area (Section 3.6)	<ul style="list-style-type: none"> Injection parameter data and observations from field implementation regarding ability to deliver amendments to target zone. nBA and tracer concentrations in groundwater and nBA in soil samples following PED amendment. 	<ul style="list-style-type: none"> Able to deliver desired volume of PED-amended fluid to target zone in a reasonable time (subject to limitations due to geology). Delivery of at least 75% of the target volume (33,600 gal) of injectate. Concentrations of PED and tracer are well distributed following amendment. 	<p>Success.</p> <ul style="list-style-type: none"> Target volume and concentration of PED-amended fluid (33,600 gal) was successfully injected to the target zones. PED and tracer were reasonably well distributed following amendment.
Increased DNAPL dissolution (Section 3.7)	<ul style="list-style-type: none"> Pre- and post-amendment VOC concentrations in groundwater 	<ul style="list-style-type: none"> Increase in total VOC mass flux to extraction wells. Total VOC concentrations (as parent-compound equivalents) will show greater enhancement factor than typical donor application (+50% compared with soluble). 	<p>Generally Confirmed.</p> <ul style="list-style-type: none"> Lower zone experienced an increase in total VOC mass flux to the extraction well. Upper zone did not show an increase in total VOC mass flux to the extraction well. Lower zone enhancement factor was in the range for a typical donor application.

TABLE 1. PERFORMANCE OBJECTIVES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Performance Objective	Data Requirements	Success Criteria	Results
Quantitative Performance Objectives			
Improved efficiency of electron donor utilization (Section 3.8)	<ul style="list-style-type: none"> Concentrations of VOCs, nBA & n-butanol, VFAs, TOC and DHGs in groundwater. 	<ul style="list-style-type: none"> Quantity of dechlorination products relative to amount of nBA consumed will be in greater proportion than typically observed using traditional soluble non-PED donors. 	Uncertain. <ul style="list-style-type: none"> Production of cDCE is masked by existing plume. Final soils do not have nBA, so appears all nBA is in system as TOC.
Reduction in DNAPL mass in the source area (Section 3.9)	<ul style="list-style-type: none"> Pre- and post-amendment VOC concentrations in soil and groundwater 	<ul style="list-style-type: none"> Discernable reduction in the DNAPL mass within the source area. (50% reduction in mass from PED addition). 	Confirmed. <ul style="list-style-type: none"> Interpolated TVOC mass in DEM/VAL plot accounting for sorption showed a significant decline in TVOC mass (77%). Soil data is sparse and cannot be used to confidently evaluate this metric.
Reduce operation and maintenance costs (Section 3.10)	<ul style="list-style-type: none"> Costs for operation and maintenance, including materials, labor and analytical costs. Time of operation compared to typical application of soluble non-PED donor, using apparent DNAPL dissolution rates to estimate remedial timeframe. 	<ul style="list-style-type: none"> Shorter remedial timeframe resulting from PED application (relative to non-PED donor), which will lead to reduced operation and maintenance costs. Experience 25% decrease relative to soluble donor 	Generally confirmed. <ul style="list-style-type: none"> Donor addition lasted longer, with no biofouling issues, hence requires less frequent donor addition and maintenance. Estimate of remedial timeframe is difficult.

Notes:

DNAPL – dense non-aqueous phase liquid	TVOC - total volatile organic compounds
nBA - n-butyl acetate	VFA - volatile fatty acid
PED - partitioning electron donor	VOC - volatile organic compound
TOC – total organic compound	

3.1 QUALITATIVE PERFORMANCE OBJECTIVE: EASE OF IMPLEMENTATION

To increase the likelihood that the PED technology will be adopted as an approach to source zone bioremediation, it should be straightforward to implement. Ease of implementation using standard equipment and application methods is an important benefit of the PED technology.

The ease of implementation was evaluated based on the experience of field staff and the actual availability and costs of installed equipment. The success criterion for this objective is that PED amendment to the source area is effectively achieved using readily available equipment.

This objective was achieved based on experience with the actual injection of nBA (the PED) at the Site. PED was successfully introduced to the source area using readily available direct-push injection equipment. The injection contractor performed essentially standard injections with a few extra precautions (e.g. bonding and grounding) for handling the pure nBA. Field application of nBA was deemed comparable to traditional soluble donor amendment in terms of equipment, time and effort, once the field crew were educated about nBA handling.

The equipment required for the solar-powered recirculation system was also standard issue, readily available through local suppliers and assembled by technicians with training in basic plumbing techniques.

Ease of implementation using standard equipment and application methods is an important benefit of the PED technology, since this facilitates it being adopted as an approach to source zone bioremediation.

3.2 QUALITATIVE PERFORMANCE OBJECTIVE: ABILITY TO PROMOTE BIODEGRADATION

To be effective, the PED must have promoted biodegradation of the target contaminants. The reduction in contaminant mass is a function of the degree to which biodegradation was promoted in the subsurface. A new control plot was not established for the DEM/VAL, but the project used the results from a prior pilot-scale demonstration at LC34 (Battelle, 2004; Hood et al., 2008) for comparison to a soluble donor system (the previous project used ethanol). Addition of any electron donor can promote growth (biomass) which will in turn accelerate the consumption rate of donor (i.e., the donor consumption rate will vary in time and space) and as such it was not possible to statistically assess equivalent bioactivity between the prior study and the PED demonstration. Note that the goal was not to stimulate equivalent bioactivity – the prior LC34 demonstration experienced biofouling and maintenance to control biofouling was a significant cost. The goal was to demonstrate that the PED (nBA) can be utilized by the native dechlorinating microorganisms and had the ability to promote biodegradation of TCE.

The ability to promote biodegradation using the PED technology was evaluated on the basis of increases in the concentrations of dechlorination breakdown products and increases in the population of microorganisms capable of dechlorination. Reductions in concentration of the

parent compounds also contributed to the evaluation of biodegradation activity. Groundwater samples were collected prior to donor amendment to establish baseline VOC concentrations and microbial numbers; groundwater samples were then collected over time during the demonstration to monitor changes in concentration and/or microbial numbers.

Figure 1 presents the VOC concentrations and microbial enumeration (*Dhc* and *vcrA*) values obtained at the extraction wells for the upper and lower aquifer units (RW0007 and RW0008; respectively). The addition of nBA as an electron donor promoted biodegradation of TCE to less chlorinated daughter products and resulted in a substantial increase in the native dechlorinating populations.

This objective was confirmed by the increases in the concentration of degradation products (cDCE, VC and ethene) from the reductive dechlorination of TCE and increases in the population of dechlorinating microorganisms in response to PED addition. In both the upper and lower treatment zones, sustained production of dechlorination products, including ethene, was observed, demonstrating that the PED (nBA) could be utilized by the native dechlorinating microorganisms and thus had the ability to promote biodegradation of TCE.

3.3 QUALITATIVE PERFORMANCE OBJECTIVE: LONGEVITY OF ELECTRON DONOR SUPPLY

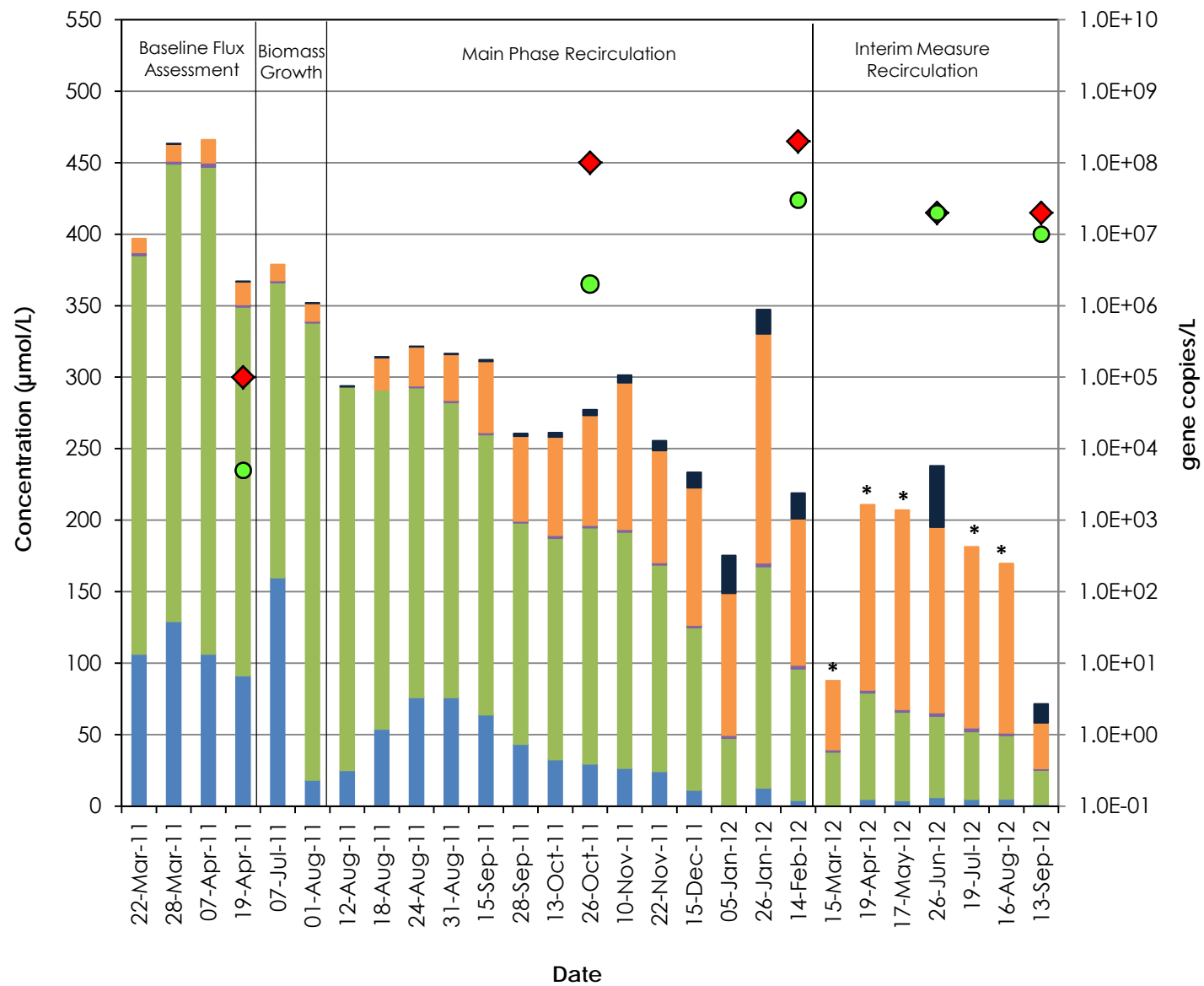
The principal attribute of the PED technology is that the supplied electron donor partitions into residual DNAPL, if present, when it is first supplied, and then re-partitions to groundwater along with VOCs as they dissolve from the NAPL-phase or desorb from solid phases, thus supplying electron donor to the NAPL:water interface where it may be utilized by dechlorinating bacteria. This property of the PED compound means that it needs to be applied less frequently, since the initial quantity amended can be designed to supply reducing equivalents for multiple pore volumes, thus decreasing the frequency of, and associated costs for repeat donor applications.

Longevity of electron donor supply was assessed using time-series groundwater concentration data, namely the concentrations of remaining nBA, donor breakdown products (including n-Butanol [nBuOH] from nBA), VFAs and TOC. Sustained donor supply from a one-time addition of PED is desirable, as it requires reduced frequency of donor replenishment.

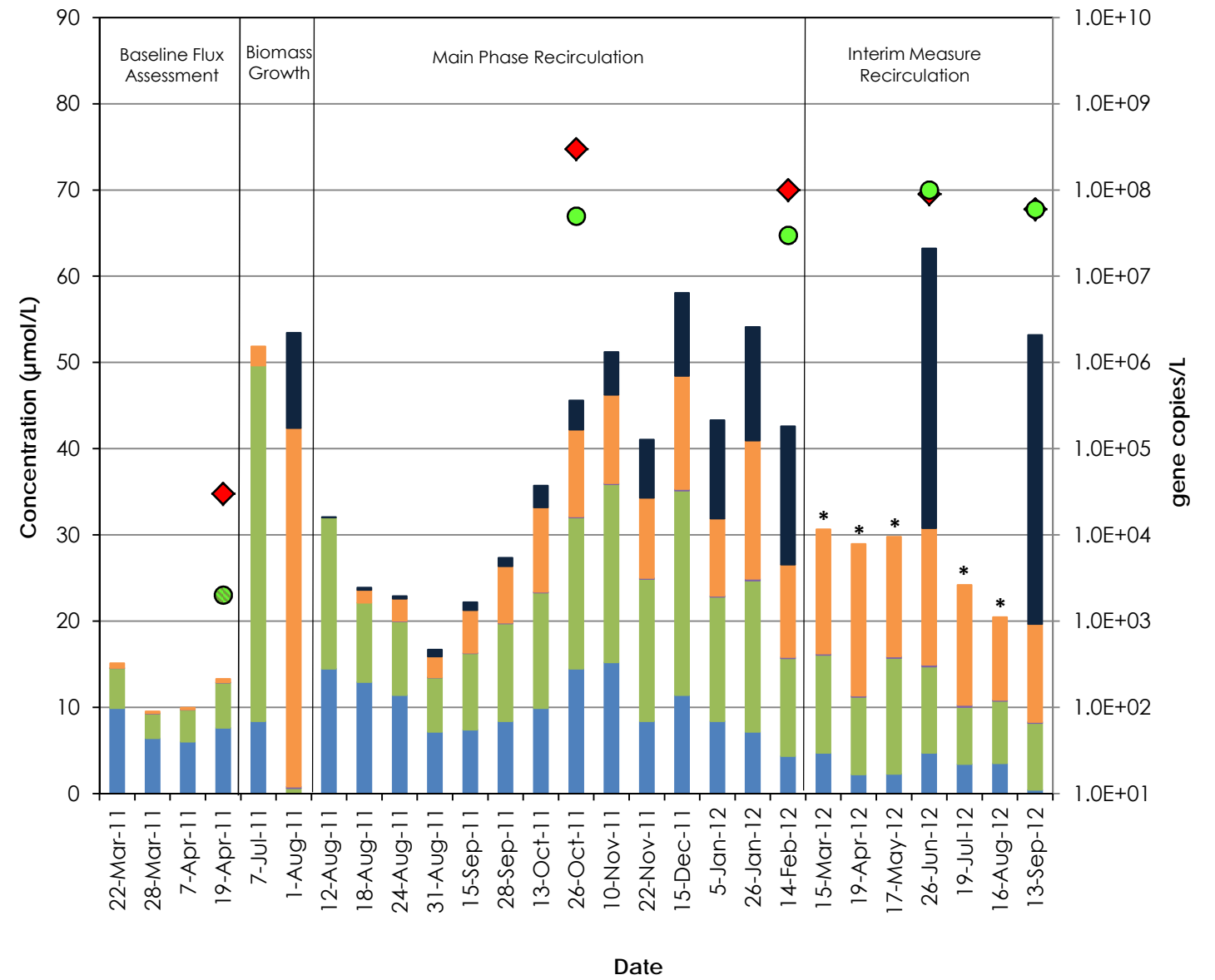
This objective was confirmed by the persistence of electron donor equivalents throughout the DEM/VAL operation. The concentrations of nBA, nBuOH, VFAs and TOC were assessed and are plotted in time-series figures. Donor concentrations observed at the central extraction wells, RW0007 and RW0008, were assessed in terms of the amount of carbon (i.e. millimole equivalents of carbon per liter [mmol C/L]) and indicate that the measured TOC concentrations were generally equal to the sum of the individually quantified components. For example, at RW0007 the TOC concentration was, on average, 91% of the sum of the VFAs plus other carbon-containing compounds (nBA, nBuOH, VOCs and dissolved hydrocarbon gases [DHGs]) and at RW0008, the TOC concentration was 99% of the sum of the VFAs and other measured

carbon-containing compounds (Figure 2). A one-time addition of the PED was sufficient for at least one year of recirculation in the DEM/VAL scenario.

1a) RW0007



1b) RW0008



■ TCE
 ■ cDCE
 ■ tDCE
 ■ VC
 ■ Ethene
 ◆ Dhc
 ● vcrA

Notes:

Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride
 * - no analysis for ethene
 Symbols represent microbial characterization results
 gene copies/ L - number of microbial genes containing selected markers per liter
 Dhc - total Dehalococcoides microbes (qPCR for 16S rRNA gene)
 vcrA - qPCR analysis for the Dehalococcoides vinyl chloride reductase (vcrA) gene

**Volatile Organic Carbon Distribution History &
 Microbial Counts for RW0007 & RW0008**
 Launch Complex 34, Cape Canaveral, FL



Figure

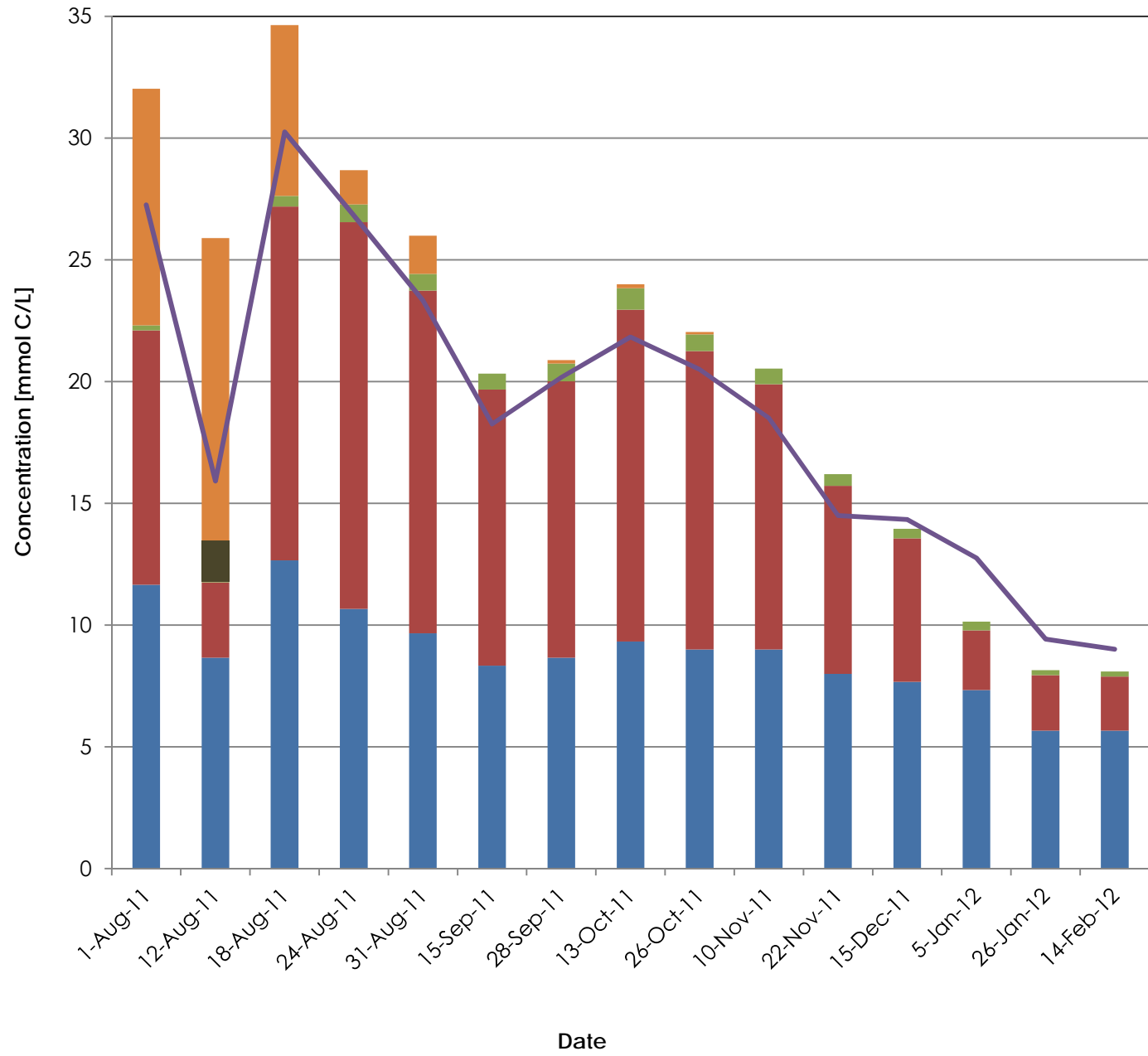
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Guelph

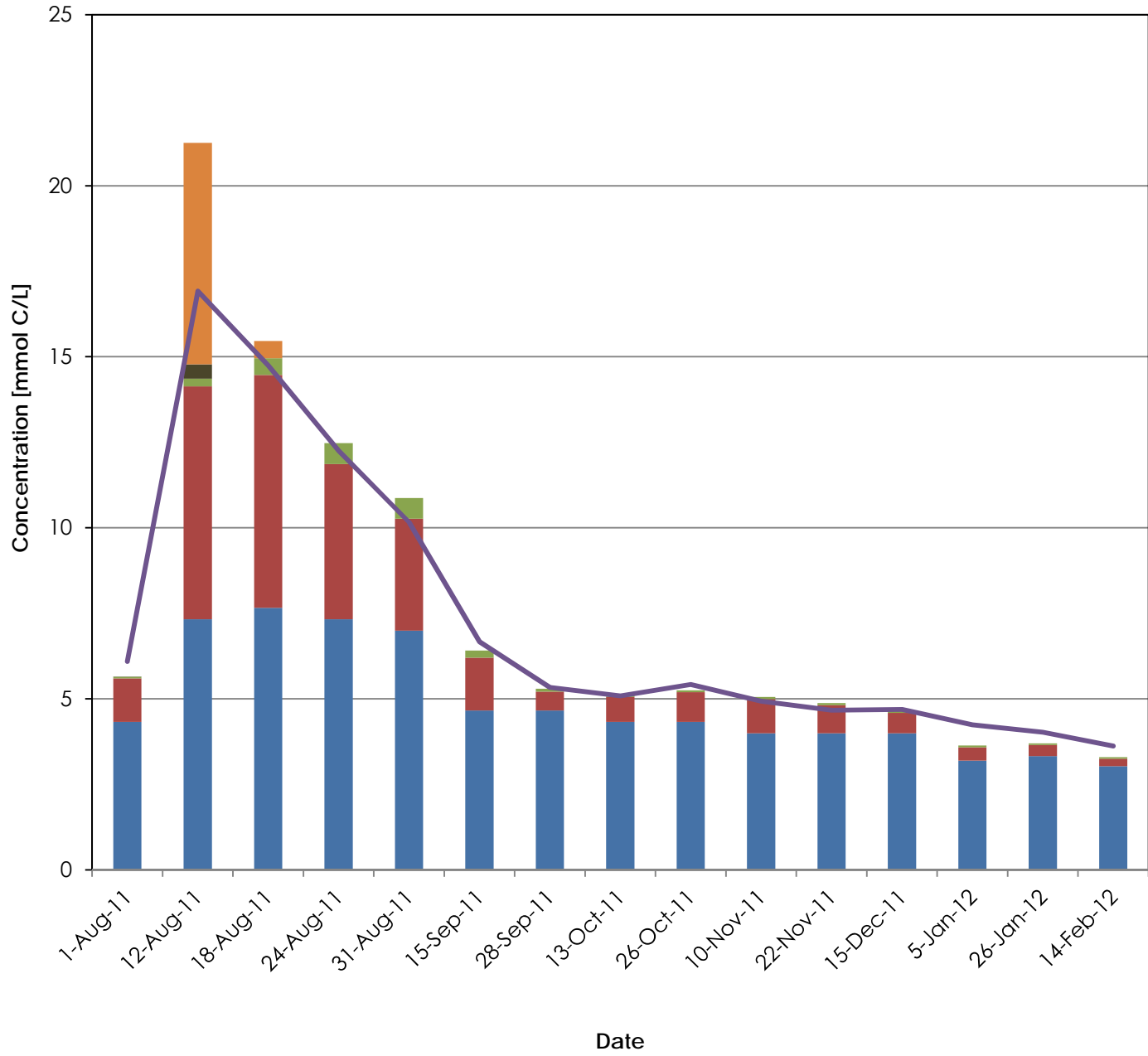
October 2013

P:\PA\Project\A180272 - ESTCP - PED\04 ESTCP Reporting\01 Final Technical Report\03 FIGURES\Figure 2a-ba.jpg\Fig 2a_b

2a) RW0007



2b) RW0008



Acetic Butanoic Propionic nBA n-butanol TOC

Carbon in TOC and VFAs RW0007 & RW0008 Launch Complex 34, Cape Canaveral, FL	
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Figure 2	

3.4 QUALITATIVE PERFORMANCE OBJECTIVE: PED PARTITIONS INTO THE DNAPL

A major feature of the PED technology is the ability of the PED to partition into residual DNAPL phases and sorb to solid-phase carbon, resulting in a decrease in the concentration of PED in groundwater. The amount of concentration change will be directly related to the amount of residual NAPL phase; however, the amount of residual NAPL present in the area is not known, so the degree of concentration change cannot be predicted. It is thus a qualitative objective to detect the uptake of the PED. The PED (nBA) is selected for its high partitioning coefficient, so that a large proportion of the PED delivered initially will become associated with residual NAPL and sorbed-phase contaminants, and be gradually released to groundwater over time as the NAPL dissolves and releases contaminants.

The partitioning of PED into DNAPL was evaluated using groundwater analyses for conservative tracers (bromide and iodide), nBA and nBuOH, and TOC following PED injection. In the Demonstration Plan, it was suggested that nBA and VOC concentrations in soil would be analysed as well, but this was deemed impractical, as it would not be possible to determine whether the nBA and VOCs were in a NAPL phase or not. Because baseline soil data for VOCs showed considerable spatial variability and the presence of DNAPL was not confirmed, it was considered infeasible to attempt to quantify nBA within TCE-NAPL through soil sampling.

Data collected in the field DEM/VAL did not have sufficient resolution to demonstrate PED partitioning into DNAPL. However, this objective was validated during the laboratory treatability tests which clearly demonstrated partitioning in the laboratory column experiments. Results have been published in Environmental Science and Technology (Cápiro et al., 2011). The major reason for the apparent difference in behavior was the amount of NAPL present in each case. As discussed in the Demonstration Plan, the change in the aqueous concentrations of nBA should be proportional to the mass of residual NAPL present. In the laboratory column tests, the emplaced NAPL zone occupied 10-15% of the pore space. At this relatively high saturation, the NAPL phase can sequester a significant amount of nBA, resulting in a relatively large decrease in the aqueous phase concentration of nBA that can be readily detected. In contrast, the DEM/VAL field plot had low residual NAPL saturation (in fact, the degree of saturation could not be determined), such that only a relatively small amount of nBA would need to partition from the aqueous phase to establish equilibrium between the aqueous phase and any NAPL phase droplets. If only a small amount of nBA was sequestered from the aqueous phase, the resulting decrease in the concentration of nBA would be small and difficult to discern in the field data.

3.5 QUALITATIVE PERFORMANCE OBJECTIVE: PED PARTITIONS OUT OF THE DNAPL AT A SUITABLE RATE AND CONCENTRATION

Ideally, the applied PED, once partitioned into residual DNAPL phases and onto sorption sites, must be released to groundwater at a rate and concentration that is sufficient to support

bioremediation. The success of the technology relies on creating a sustained donor supply that matches the release of contaminants.

Assuming that PED partitioning into DNAPL is successful, the expectation is that PED will be released back to groundwater when dissolved-phase PED concentrations decrease as the un-amended groundwater is pulled into the treatment area. The intent is that this will sustain concentrations of nBA and/or its breakdown products that are greater than would persist in a soluble donor system after a pore volume of water has been extracted. In a soluble donor system, the donor will be removed with groundwater. In the PED system, donor is re-supplied from the DNAPL phase (and sorptive sites).

Assessment of this objective required use of nBA concentrations in groundwater over time, nBuOH concentrations, VFA and TOC concentrations, and VOC concentrations in groundwater. The assessment was not straightforward, as the nBA was actively consumed as it migrated toward the extraction well; however, evidence of sustained donor supply provided by the presence of dechlorination products should also support the evaluation. Changes in the amount of DNAPL dissolution were assessed by comparing the total flux of VOCs observed at the central extraction wells before and after application of the PED.

The objective was met. Sustained concentrations of electron donor (TOC and VFAs) were observed, with production of dechlorination products. Microbial numbers also increased. Additional supporting information on this objective is provided in Section 5.7.

3.6 QUANTITATIVE PERFORMANCE OBJECTIVE: ABILITY TO DELIVER PED INTO THE SOURCE AREAS

One objective of the PED DEM/VAL was to demonstrate that the PED can be readily delivered to the source area. In order to be an effective bioremediation approach, the application of PED should have been reasonably comparable to that of other traditional electron donors, so that its other properties can provide an overall benefit. The ability to deliver the design quantity of PED into the source area was expected to be comparable to that of other electron donors.

The objective was to be considered met if the design quantity of PED-amended fluid was delivered to the target zones within a reasonable amount of time (hours), using reasonable injection pressures. The success criterion was to amend at least 75% of the target volume (33,600 gal). This objective was achieved. The injection program successfully delivered the target volume and concentration of PED-amended fluid to the target zones: 34,000 gal of injectate containing 3,000 mg/L nBA with bromide and/or iodide as tracers was injected.

An additional consideration for this objective was that the post-injection concentrations of nBA, in soil and groundwater, were well distributed following amendment. This objective was also met as evidenced by the post-injection sampling event where 11 locations were sampled and

nBA was found in all but the sampling location within the silty clay layer. Of the 10 locations with nBA, 8 had nBA concentrations in excess of 10 mg/L.

3.7 QUANTITATIVE PERFORMANCE OBJECTIVE: INCREASED DNAPL DISSOLUTION

The PED technology is designed to provide electron donor at the NAPL:water interface to promote growth of dechlorinating biomass as close to the source of dissolved-phase VOCs as possible. By promoting and supporting reductive dechlorination close to the NAPL:water interface, the PED creates a steep concentration gradient between the NAPL and the aqueous phases, which results in increased DNAPL dissolution.

The amount of DNAPL dissolution was assessed by comparing the mass discharge of VOCs before and after application of the donor. Mass discharge is an integrated estimate of the mass flux, representing the total mass of any solute conveyed by groundwater through a plane, in this case a cylindrical surface around the extraction well. One advantage of this method is that the extraction well effectively integrates flow and concentration so that even small concentration hot spots and high-transmissivity zones are captured by the well and included in the estimate (ITRC, 2010). Typically this approach requires that the pumping well not increase the flow through the source zone, which might increase the dissolution rate (concentrations may or may not change), pumping be continued long enough that relatively steady-state conditions are achieved, and capture of the high-discharge portions of the plume must be complete or near-complete (ITRC, 2010).

The mass discharge was calculated from the groundwater VOC concentration data and the pumping rate and volume data. The total amount of TCE equivalents was calculated as the sum of TCE and its breakdown products, on a molar basis. The product of these measured concentrations and the volumetric pumping rate yielded an estimate of the total mass discharge rate. Using the pumped volumes, estimates of cumulative total mass discharge over time were determined. Changes in the total amount of TCE equivalents over time indicated changes in the rate of DNAPL dissolution. Extracted groundwater was re-injected in the peripheral ring of injection wells without removing VOCs (or donor); thus, dissolved species in groundwater removed from the extraction wells were re-introduced to the aquifer at the perimeter of the sweep zones. However, to account for this, estimates of the relative amount of recycle were obtained from comparison of the pumped volumes to estimates of the sweep zone pore volume, the tracer data and the TOC data.

It was expected that the PED plot would have increases in total VOC concentrations following amendment with nBA (relative to baseline). This increase in total VOC mass flux would be a primary indicator that the PED application worked as intended. The objective was to be considered met if the increase in total VOC mass flux observed in the PED plot was 50% or greater than that typically observed at sites where soluble donor was applied.

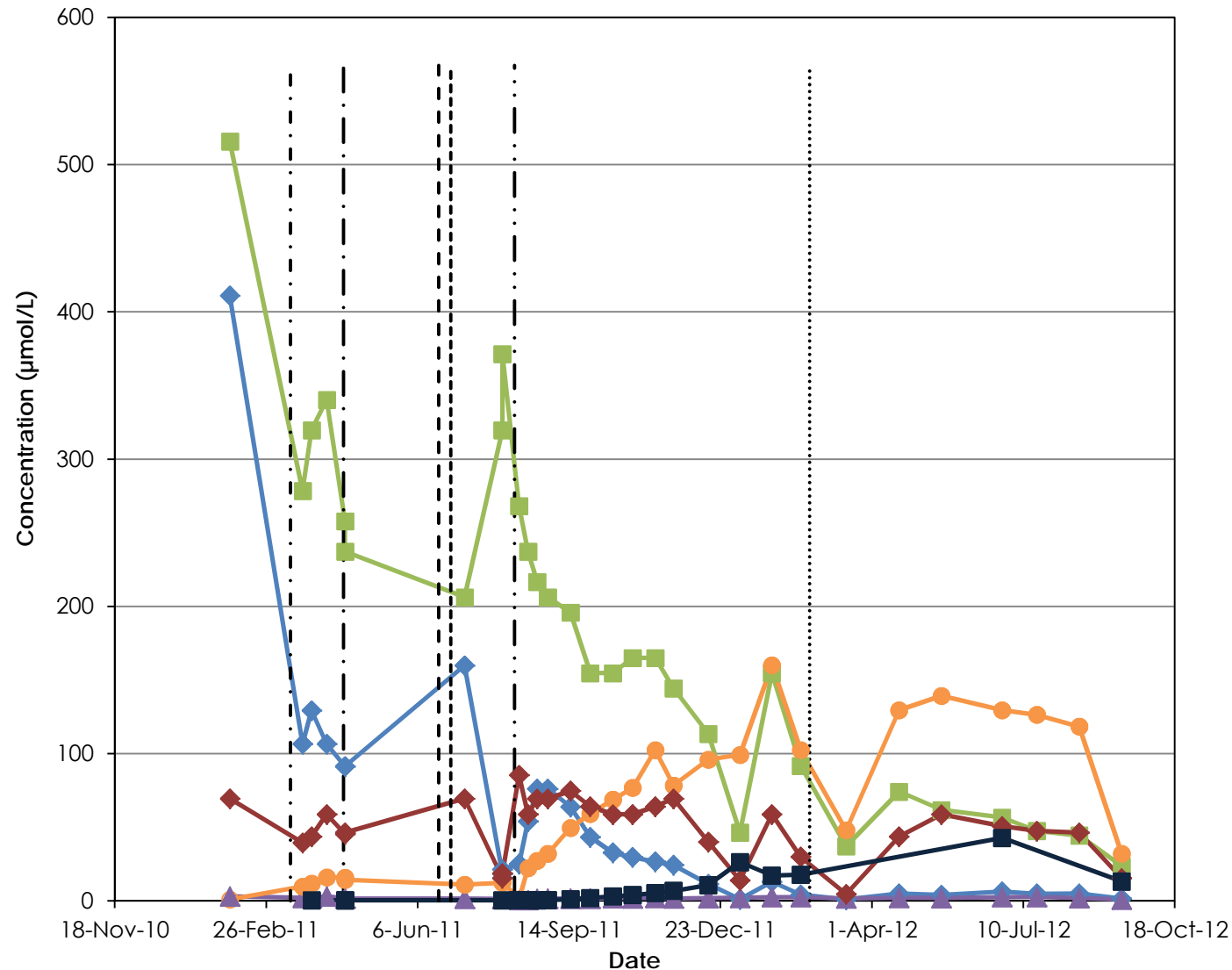
This quantitative performance metric was met. In the lower zone there was an increase in the total VOC mass flux to the extraction well over the evaluation period. However, in the upper zone an increase in total VOC mass flux to the extraction well was not observed. The upper zone may have been affected by the presence of high concentrations of 1,1,2-Trichloro-1,2,2-trifluoroethane (CFC113), a compound that can inhibit reductive dechlorination to ethene.

Time trend plots of the VOCs at extraction wells RW0007 and RW0008 are presented in Figures 3a and 3b. Total VOC mass discharge did not increase at the extraction well in the upper zone even though there was a definite shift towards lesser-chlorinated degradation products, as illustrated by the extent of dechlorination calculation shown in Figure 4a. A number of factors may have contributed to this, including:

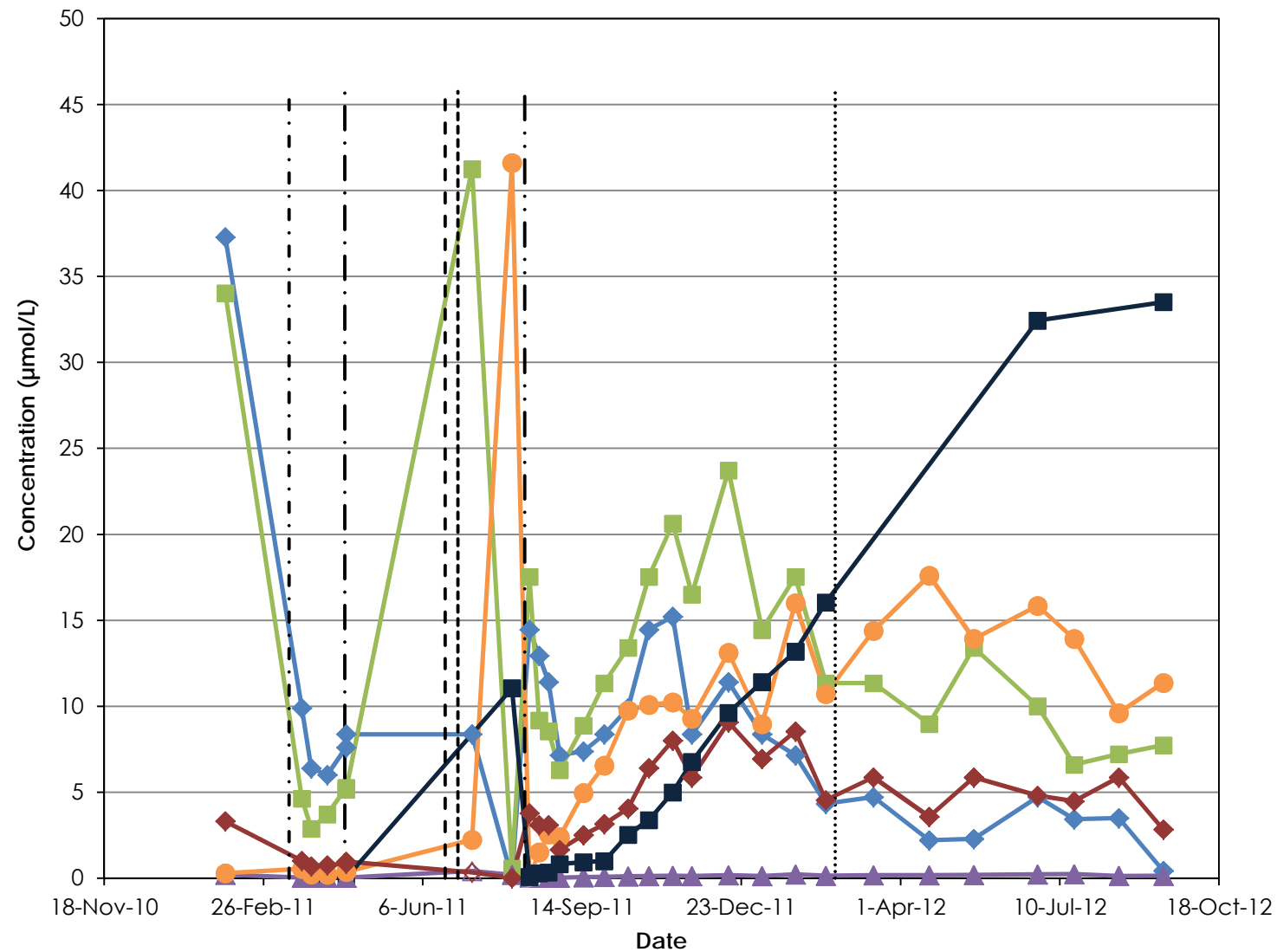
- Elevated concentrations of cDCE present in soil and groundwater before the DEM/VAL began obscured the effect of PED promoting degradation of TCE to cDCE;
- Sustained elevated concentrations of CFC113 could inhibit the dechlorination of cDCE, which would further obscure the quantification of the amount of dechlorination; and
- Distribution of TCE (and CFC113) was non-uniform. Most of the TCE mass was found at BW0001 and RW0007, suggesting there may have been DNAPL in that portion of the demonstration area, but not uniformly around the extraction well, so that the pumped groundwater represents a blend of water that passed through a source zone where contact with residual DNAPL was possible, and other water that came from/through other portions of the demonstration area(s) where there was little TCE NAPL to contact.

The lower zone did experience an increase in total VOC mass discharge at the extraction well. The concentration trend is presented in Figure 3b. This figure shows that the increasing total VOC mass in extracted groundwater was due to increasing amounts of TCE degradation products. This is also illustrated by the extent of dechlorination calculation shown in Figure 4b.

3a) RW0007



3b) RW0008



◆ TCE ■ cDCE ▲ tDCE ○ VC ◆ CFC113 ■ Ethene

Notes:

µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

- · - Start Baseline Recirculation
 - · - End Baseline Recirculation
 - - - Start nBA Injection
 - - - End nBA Injection
 - · - Start Main Recirculation
 ····· Start Interim Measure Recirculation

Volatile Organic Compound Time Trends
RW0007 & RW0008
 Launch Complex 34, Cape Canaveral, FL



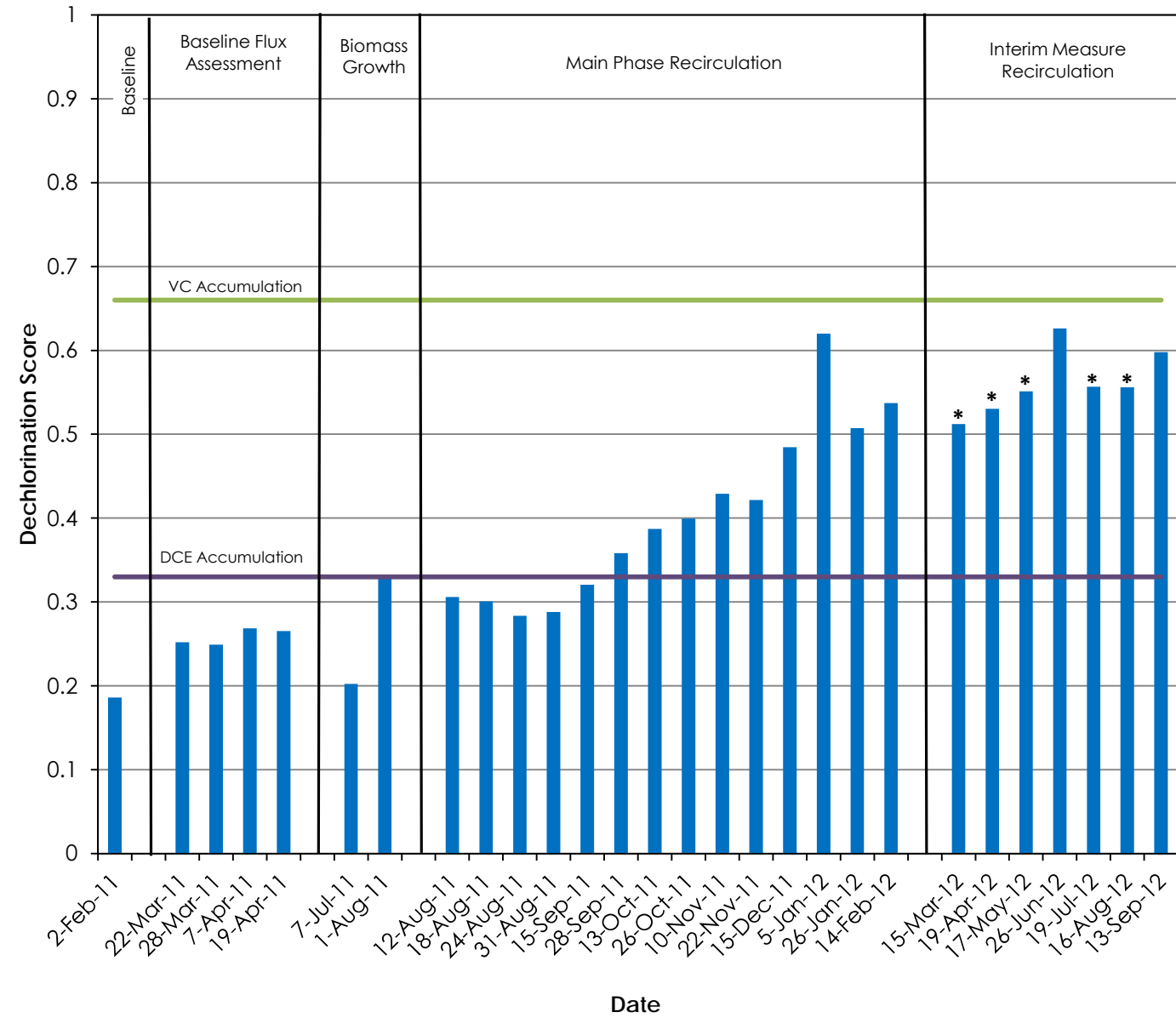
Figure

3

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October 2013

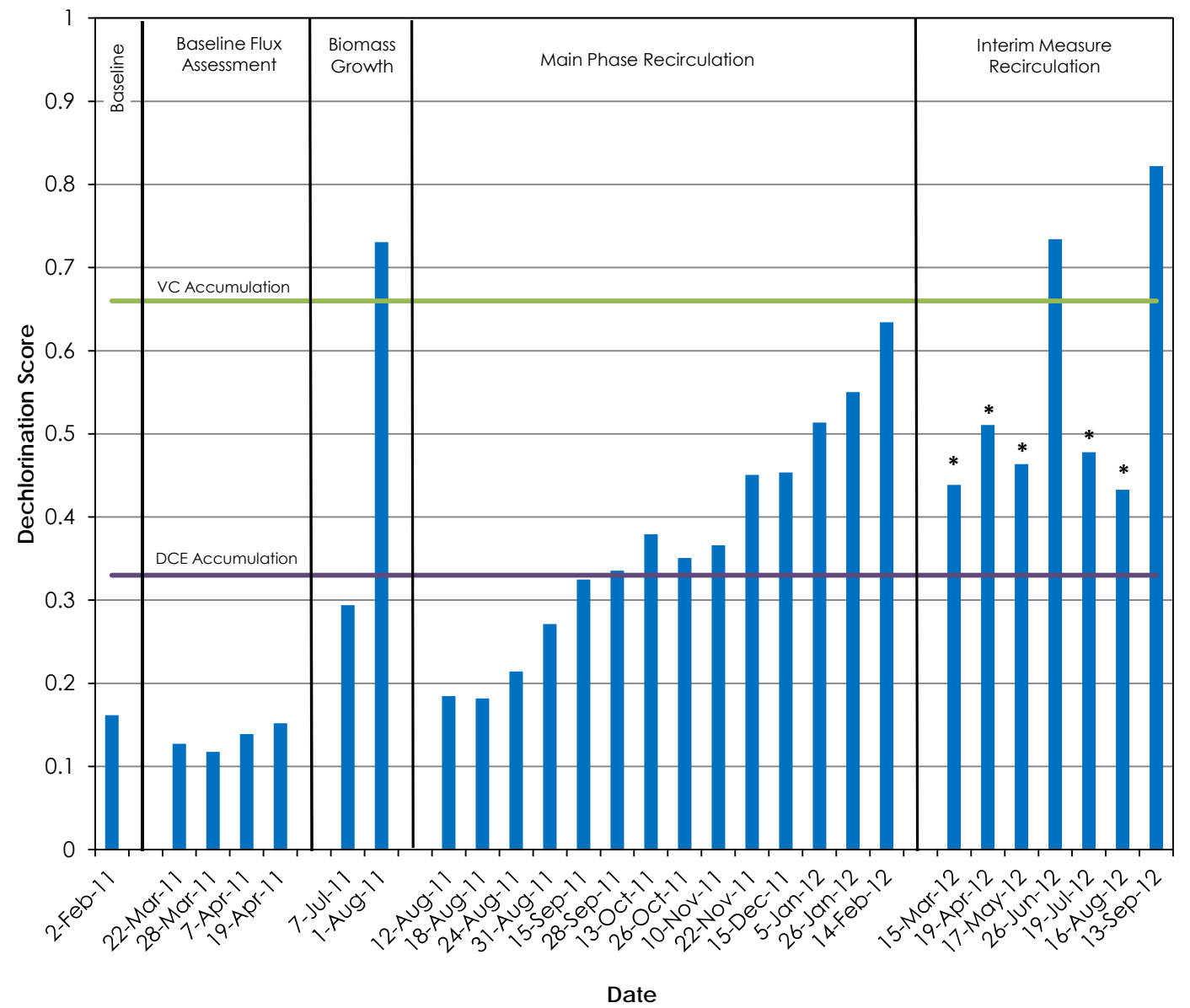
4a) RW0007



* - no analysis for ethene, so dechlorination score shown is artificially low

$$\text{Dechlorination Score (\%)} = \left(1 - \frac{3[\text{TCE}] + 2[\text{cDCE}] + 2[\text{tDCE}] + [\text{VC}]}{3([\text{TCE}] + [\text{cDCE}] + [\text{tDCE}] + [\text{VC}] + [\text{ethene}])}\right) \times 100$$

4b) RW0008



* - no analysis for ethene, so dechlorination score shown is artificially low

$$\text{Dechlorination Score (\%)} = \left(1 - \frac{3[\text{TCE}] + 2[\text{cDCE}] + 2[\text{tDCE}] + [\text{VC}]}{3([\text{TCE}] + [\text{cDCE}] + [\text{tDCE}] + [\text{VC}] + [\text{ethene}])}\right) \times 100$$

**Extent of Dechlorination
RW0007 & RW0008**
Launch Complex 34, Cape Canaveral, FL



Guelph

October 2013

Figure

4

3.8 QUANTITATIVE PERFORMANCE OBJECTIVE: IMPROVED EFFICIENCY OF ELECTRON DONOR UTILIZATION

Since PEDs partition into residual DNAPL, and then partition back into groundwater along with VOCs as they dissolve from the NAPL-phase, the electron donor may be preferentially utilized by dechlorinating bacteria. Hence, a greater proportion of the amended PED was expected to be used to support reductive dechlorination of VOCs rather than untargeted reactions (e.g., methane production).

The efficiency of electron donor utilization was assessed using the groundwater concentrations of VOCs, electron donors, breakdown products, and DHGs over time. The parent donor compound, nBA, along with its breakdown products (nBuOH, acetate, and other VFAs), were monitored, in addition to the VOCs and their breakdown products, plus other compounds that may have formed, such as methane, so that a detailed understanding of the donor consumption pathways was ascertained.

The objective would be considered met if the ‘utilization ratio’ was greater for PED than is typically observed with traditional soluble donors. The success criterion would be an observed increase in utilization ratio of 50% or greater relative to the soluble donor system of the prior LC34 study (Battelle, 2004; Hood et al., 2008).

The PED lasted longer than a soluble donor. Several pore volume flushes were completed and if the donor was soluble it would have been extracted from the system. However, determining that the PED was more than 50% better than a soluble donor was not quantitatively determined. In the upper sweep zone significant cDCE was present at the start of the DEM/VAL and so production of cDCE from PED addition was not simply discerned as an increase in cDCE. This was not the case for the LC34 study. There were also elevated concentrations of CFC113 in many of the collected groundwater samples, which can inhibit dechlorination and hence limit confirmation of the objective. Nevertheless, the PED can be considered similar to other long term electron donors (e.g., emulsified vegetable oils) over the benefits of soluble donors (e.g., lactate or ethanol). Therefore, quantification of the 50% improvement of the PED over soluble donor utilization was not definitive, but we have evidence that it should be an improvement over soluble donors and possibly as effective as emulsified vegetable oil donors.

3.9 QUANTITATIVE PERFORMANCE OBJECTIVE: REDUCTION IN DNAPL MASS IN THE SOURCE AREA

One goal of source zone bioremediation is to reduce the amount of DNAPL remaining in the source area, to reduce the expected time for clean-up. Reduced source mass may also result in reduced VOC loading to the downgradient plume.

Assessment of this objective was based on the baseline and final VOC concentrations in soil and groundwater. If the PED is able to partition effectively into residual DNAPL and this promotes

bioactivity then a decrease in soil VOC concentrations should occur. This may increase groundwater VOC concentrations (in part due to production of daughter products).

Soil samples were collected from the DEM/VAL at four intervals (baseline, post-biomass growth phase and two during recirculation phase). The baseline soil samples were collected from different locations to the remaining three events. Results for each event were averaged together to develop an average soil concentration (see table below) to estimate TCE and cDCE in soils at the locations sampled. There is a decline in the amount of TCE detected over the course of the DEM/VAL, from the end of the Biomass Growth Phase to the end of the Main Recirculation Phase (Month 7) to the end of the Interim Measure Recirculation Phase (Month 13). Note that baseline is quite different because it represents a different set of locations.

Average Soil Concentrations (mg/kg)

	TCE	cDCE
Baseline	3.60	2.35
Post Biomass Growth	21.27	2.89
Post Main Recirculation Phase (Month 7)	13.07	5.83
Post Interim Measure Recirculation Phase (Month 13)	10.23	5.70

The objective was confirmed based on the interpolated VOC mass in the treatment zone assuming sorption is unchanged over the DEM/VAL. There was a significant decline in total volatile organic compound (TVOC) mass, with an estimated 77% decrease over the DEM/VAL.

3.10 QUANTITATIVE PERFORMANCE OBJECTIVE: REDUCE OPERATION AND MAINTENANCE COSTS

A major feature of the PED technology is the reduced frequency of donor replenishment (and the commensurate reduction in application costs), and the shorter remedial timeframes, resulting in lower operation and maintenance (O&M) costs anticipated due to increased rates of DNAPL dissolution. The success of the PED technology depends on the degree to which these reductions in the number of applications and in the cost of operation and maintenance can be realized.

The reduction in operation and maintenance costs was estimated on the basis of the data collected during the DEM/VAL, including the costs for materials, labor and analytical costs. The time of operation relative to operation with a soluble donor was extrapolated using apparent DNAPL dissolution rates to estimate remedial timeframe. The laboratory experiments (see Section 5.3) and the field observed longevity (section 5.7) were used to estimate the frequency of re-amendment, to estimate costs over the lifetime of the remedy.

The performance objective was generally confirmed. The PED remained longer in the groundwater compared to a simple soluble donor (e.g., lactate) and promoted dechlorination. After 8 months of recirculation there was still enough residual organic carbon to promote bioactivity. On this basis we can conclude that the donor lasted longer than estimated, with no

significant biofouling issues and hence less frequent donor addition and maintenance with the PED over a soluble donor. Given this it would be likely that the PED will provide a shorter remedial timeframe but it is not exactly known if this will be a cost savings of 25% or more. At the end of the DEM/VAL VOC mass remained in parts of the test area and the time to completely treat remaining VOCs was not known.

4 SITE DESCRIPTION

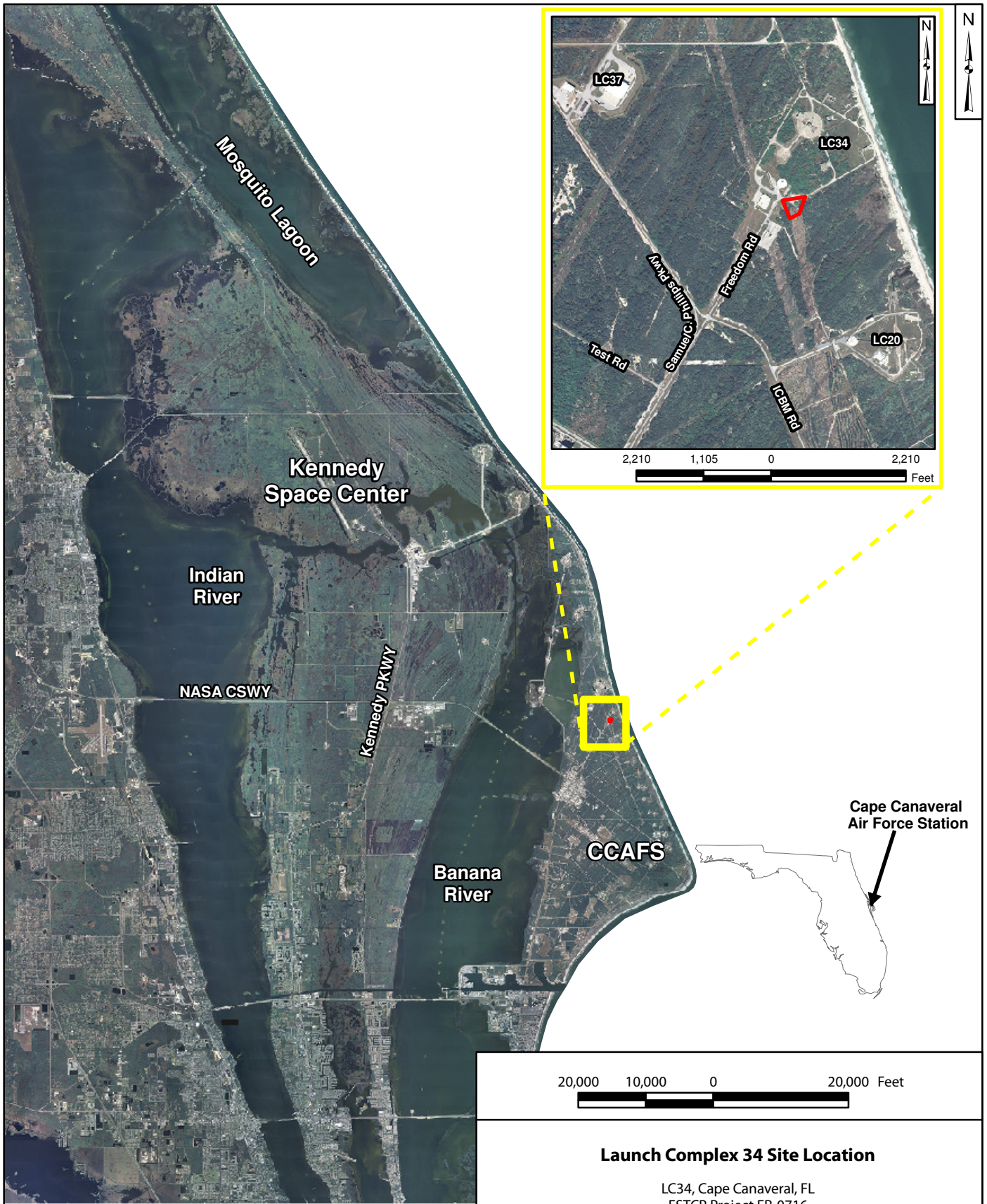
4.1 SITE LOCATION AND HISTORY

Hot Spot 1 is located at LC34 on CCAFS on the east-central Atlantic coast of Florida in Brevard County (Figure 5). The site is located east of the former ESB as shown on Figure 6. Prior to development, LC34 consisted of relict sand dunes and interdunal swales typical of barrier island depositional environments.

A full description of the site history, operations, investigations, and analytical results is detailed in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report (NASA, 1999), RFI Addendum Report (NASA, 2003), and the Corrective Measures Study (CMS) Report (NASA, 2007).

The launch complex was designed to support NASA's Saturn 1 and Saturn 1B program during Project Apollo. Construction started on LC34 in June 1959, and NASA accepted the site from the contractor in January 1962. Four Saturn 1 and three Saturn 1B vehicles were launched from LC34 between 27 October 1961 and 12 October 1968. Launch operations at LC34 included the storage, transport, and use of nitrogen, helium, liquid oxygen (LOX), RP-1 fuel (modified kerosene fuel), liquid hydrogen, hydrazine, and nitrogen tetroxide. Helium was used as a mixing agent in the LOX tanks of the booster rockets. Nitrogen was used for purging fuel and LOX lines, isolating engine and instrument compartments, and operating certain pneumatic components. RP-1 and LOX were used to fuel the Saturn rockets, and hydrogen, hydrazine, and nitrogen tetroxide were used aboard the various spacecraft for steering purposes. Historical records suggest that workers flushed rocket engines on the launch pad and conducted precision cleaning of spaceflight hardware in the ESB with TCE. A significant amount of solvents were likely disposed of into drains within the ESB and a grated trench system, located adjacent to the northwest side of the ESB that discharged to the sandy soil outside of the ESB. No records regarding the quantities of TCE used at the site were available.

Following the launch of Apollo 7 in 1968, the Complex was held in standby status for possible use in the Skylab program. The launch complex was taken out of service in November 1971, and the service structures along with operational equipment were scrapped in April 1972. However, the majority of the on-site buildings and structures were abandoned-in-place. Native and invasive vegetation and trees overgrew the majority of the site, with dense, wooded areas surrounding the site. The Complex was declared part of the Man In Space National Historic Landmark in 1984. NASA retained ownership of the Complex until 1994 when the land and structures were given back to the Air Force with the exception of the ESB. NASA continued to use this facility as office space until 1998 when remediation pilot demonstrations were initiated.



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Legend
 Hot Spot 1 Area

20,000 10,000 0 20,000 Feet

Launch Complex 34 Site Location

LC34, Cape Canaveral, FL
 ESTCP Project ER-0716

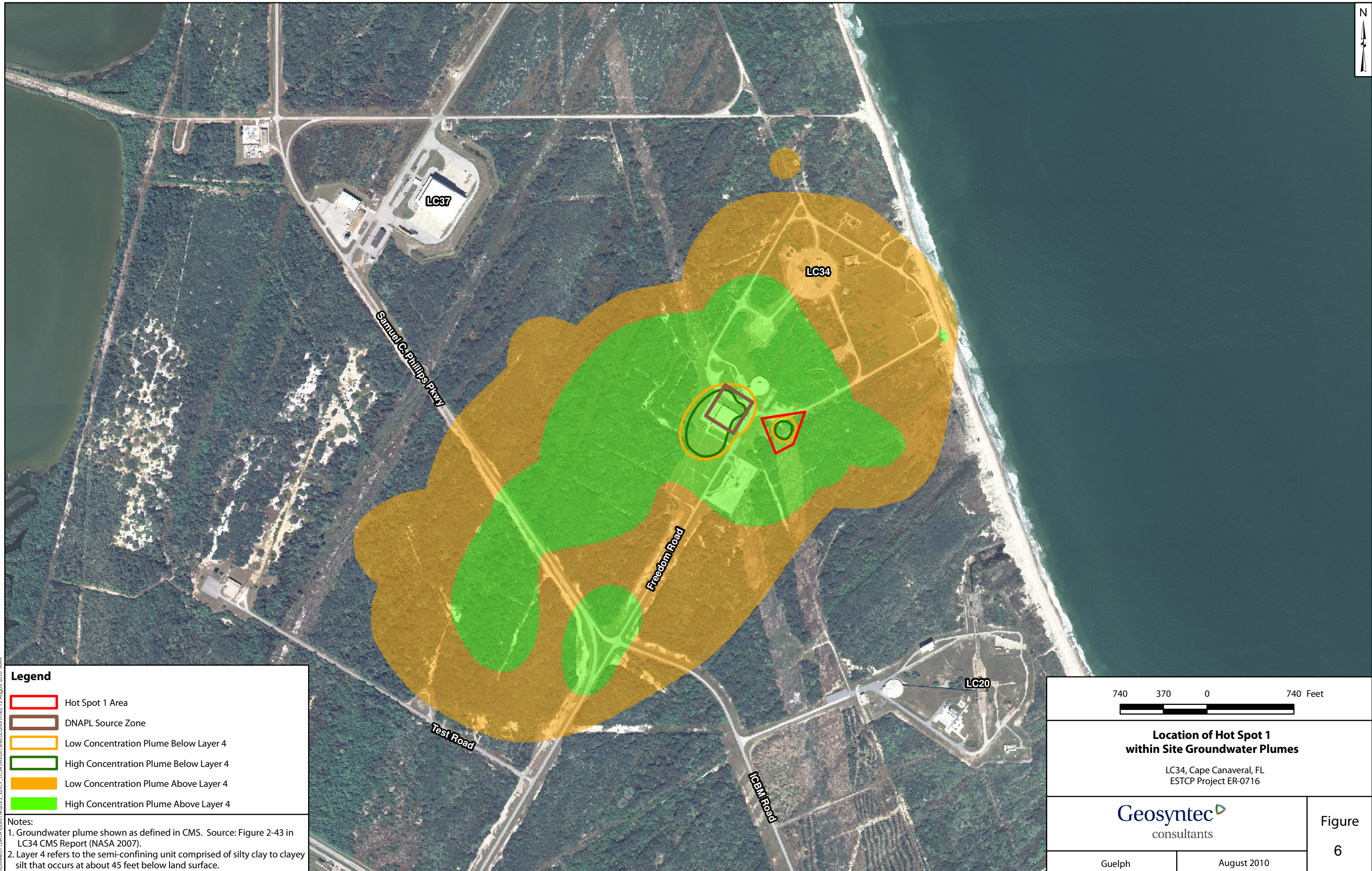
Geosyntec
 consultants

Figure

5

Guelph

August 2010



Legend

- Hot Spot 1 Area
- DNAPL Source Zone
- Low Concentration Plume Below Layer 4
- High Concentration Plume Below Layer 4
- Low Concentration Plume Above Layer 4
- High Concentration Plume Above Layer 4

Notes:

1. Groundwater plume shown as defined in CMS. Source: Figure 2-43 in LC34 CMS Report (NASA 2007).
2. Layer 4 refers to the semi-confining unit comprised of silty clay to clayey silt that occurs at about 45 feet below land surface.

<p>740 370 0 740 Feet</p>	
<p>Location of Hot Spot 1 within Site Groundwater Plumes</p> <p>LC34, Cape Canaveral, FL ESTCP Project ER-0716</p>	
<p>Geosyntec consultants</p>	<p>Figure 6</p>
<p>Guelph</p>	<p>August 2010</p>

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Previous investigations (RFI and CMS activities) indicated that the principal groundwater contaminants at LC34 included TCE and its dechlorination products, cDCE, *trans*-1,2-dichloroethene (tDCE), and VC. These impacts were caused by a significant release of TCE in the area of the ESB during the operational period from the late 1950's to 1968. It is estimated that mass remaining under the slab of the former ESB building is approximately 90,000 lbs of TCE. The groundwater impacts of VOCs present at concentrations exceeding their Groundwater Cleanup Target Levels (GCTLs) encompass an area of approximately 330 acres and extend from approximately 15 to 80 ft BLS. In the CMS (NASA, 2007) the groundwater impacts were categorized as follows (Figure 6):

- the DSZ: The DSZ includes the area within a “box” which encompasses the 100 milligram per kilogram (mg/kg) iso-concentration contour;
- the high concentration plume (HCP): The HCP includes the area of impacted groundwater with TCE, cDCE, tDCE, and VC concentrations greater than the Natural Attenuation Default Concentrations (NADCs) and less than 100 mg/kg TCE (i.e., beyond the DSZ); and
- the low concentration plume (LCP): The LCP includes the area of impacted groundwater wherein concentrations are greater than the individual GCTL for TCE, cDCE, tDCE, and VC, and less than the NADCs.

Hot Spot 1 is a small TCE source area separate from the VOC mass beneath the ESB (refer to Figure 6 and Figure 7). The TCE plume here has been generally delineated to concentrations in groundwater greater than the Florida Department of Environmental Protection (FDEP) NADC of 300 µg/L. Below this level, delineation is complicated by the presence of the larger HCP. Similarly, the cDCE and VC contributions cannot be readily quantified due to comingling of the plumes. A probable source of the Hot Spot 1 area TCE mass has been identified as a drum storage area in an old air photo from 1969. The area delimited by the 300 µg/L TCE isopleth is about 4,000 square feet (ft²), while the zone of greatest TCE concentration, within the 30,000 µg/L isopleth, is about 400 ft² in area (see Figure 12).



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4.2 SITE GEOLOGY AND HYDROGEOLOGY

4.2.1 Lithology

The shallow aquifer system at the site, which includes undifferentiated deposits of Pliocene, Pleistocene and Recent Age, consists primarily of tan to gray, medium to very fine-grained sands with varying amounts of shell fragments. This lithology is present from land surface to a depth of approximately 45 ft BLS. In the vicinity of the Launch Pad Complex, which is at a higher surface elevation than the surrounding area, this lithology is present at greater depths. A very fine-grained yellowish gray to light olive gray sand stratum containing a significant amount of silt is present from approximately 25 to 30 ft BLS; this stratum is a minimum of 5 ft in thickness. The first hydrogeologic semi-confining unit (aquitard) is present at an approximate depth of 45 ft BLS and has a typical thickness of less than 1 ft to 3 ft. Abundant shell fragments overlie the aquitards, which consists of a thin layer of light brownish gray to light olive gray silty clay to clayey silt with minor amounts of sand and shell fragments. Geotechnical analyses of five Shelby tube samples of this stratum in the vicinity of the ESB reported an average vertical hydraulic conductivity of 1.67×10^{-4} feet per day (ft/day) (5.89×10^{-8} centimeters per second [cm/sec]) (NASA, 1999).

The stratum beneath the aquitard consists primarily of light gray, medium to coarse-grained sands and silts with abundant shell fragments to a depth of 60 ft BLS. This stratum is underlain by homogeneous, light olive gray, coarse to fine sands (“salt and pepper” sand) from approximately 60 to 80 ft BLS. Light olive gray to yellowish gray, silty sand to clayey sand with abundant white shell fragments are present from 80 to 95 ft BLS. This stratum is underlain by yellowish gray to light gray, fine- to coarse-grained sands with minor amounts of shell fragments from approximately 95 to 118 ft BLS. Green clay with minor amounts of sand, phosphate nodules, and limestone fragments, are present at a depth of approximately 118 ft BLS. This represents the top of the Tamiami Formation equivalent, which extends to 125 ft BLS. The stratum also consists of yellowish gray clayey sand to clay. The Hawthorn Group is encountered at approximately 125 ft BLS and consists of yellowish gray to light olive gray clayey sand to dolosilt with up to 20% phosphate. This lithology persists to at least 140 ft BLS. Geotechnical analysis of a sample from the clay stratum indicates a vertical hydraulic conductivity of 5.1×10^{-4} ft/day (1.80×10^{-7} cm/sec) (NASA, 2003). The hydrogeologic zones encountered beneath the site are presented on Figure 8.

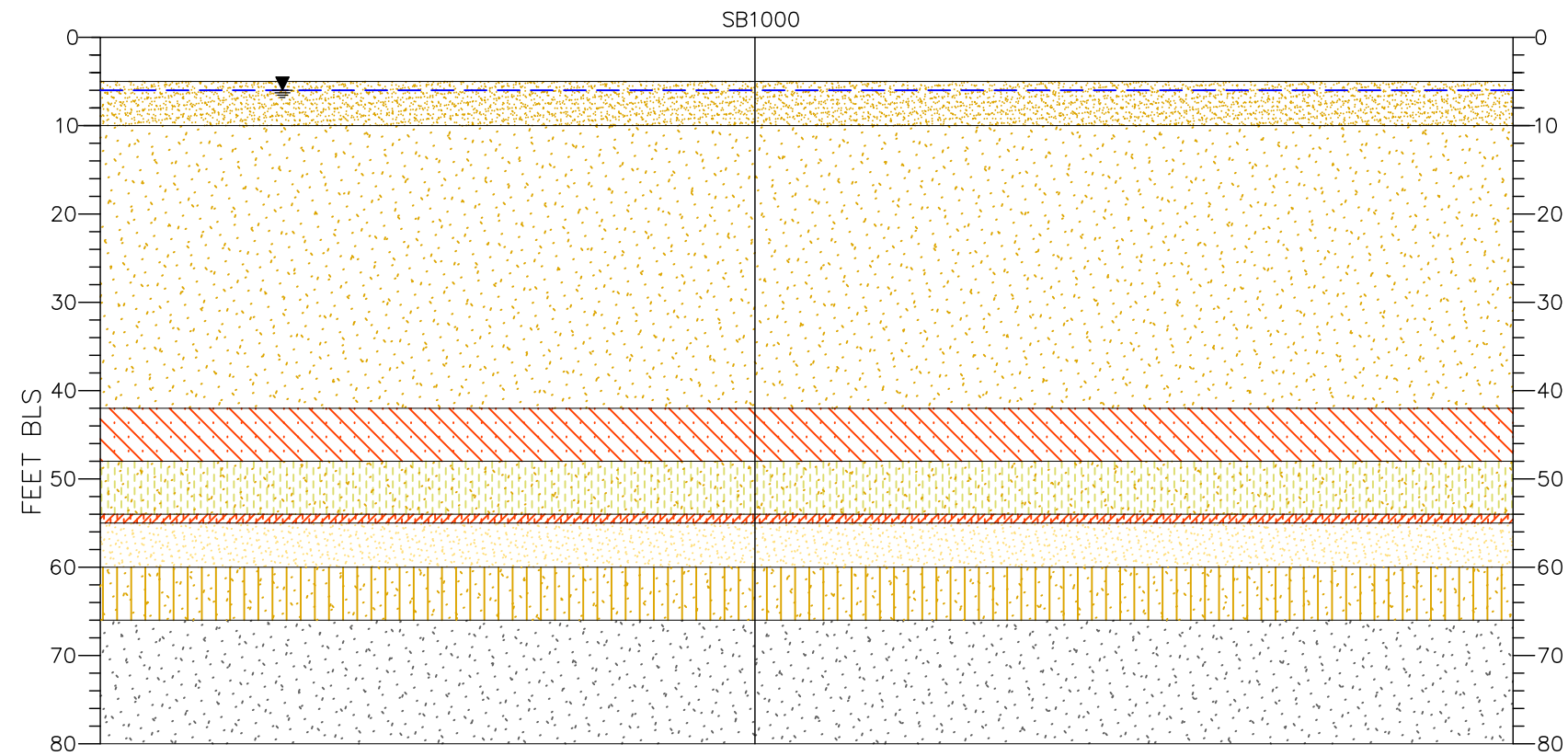
The site geology can be summarized as follows:

- Land surface to 45 ft BLS: tan to gray, medium to very fine-grained sands with varying amounts of shell fragments, with a hydraulic conductivity of 3ft/day in the 30 to 45 ft BLS interval;



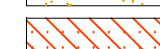




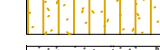
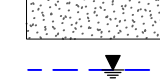
- 45 to 48 ft BLS (thickness varies): semi-confining unit comprised of silty sand to sandy clay with minor amounts of sand and shell fragments with a hydraulic conductivity of 10^{-3} to 10^{-4} ft/day;
- 48 to 60 ft BLS: medium light gray, medium to coarse-grained silty sand with abundant shell fragments with a hydraulic conductivity of approximately 2.8 ft/day (based upon pneumatic slug testing in 2009); and
- 60 to 80 ft BLS: homogeneous light olive gray, coarse to fine sands with a hydraulic conductivity of approximately 7.5 ft/day.

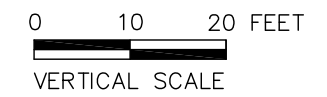
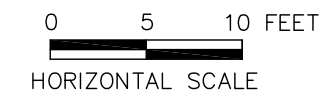
A continuous soil core was collected, using a sonic method, in the middle of the Hot Spot 1 area (SB1000, Figures 4 and 6). The core was consistent with general site lithology, with the exception of a second clay layer identified from 54 to 55 ft BLS; a generalized lithologic cross section of the Hot Spot 1 area based on that core is shown on Figure 4 and summarized as follows:

- Surface to 5 ft BLS was hand-cleared and thus not logged;
- 5 to 10 ft BLS: gray, tan, brown fine sand with shell fragments;
- 10 to 42 ft BLS: gray fine sand with shell fragments;
- 42 to 48 ft BLS: gray silty sand and silty clay with shell fragments;
- 48 to 54 ft BLS: gray fine sand with shell fragments and silt;
- 54 to 55 ft BLS: gray silty clay;
- 55 to 60 ft BLS: black, white gray medium sand;
- 60 to 66 ft BLS: silty, fine sand and fine sand with silt and shell fragments; and
- 66 to 80 ft BLS: gray and black medium sand with shell fragments.



LEGEND

-  GRAY, TAN, BROWN FINE SAND (SP) WITH SHELL FRAGMENTS
-  GRAY FINE SAND (SP) WITH SHELL FRAGMENTS
-  GRAY SILTY SAND AND SILTY CLAY (CL) WITH SHELL FRAGMENTS
-  GRAY FINE SAND (SP) WITH SHELL FRAGMENTS AND SILT
-  GRAY SILTY CLAY (CL)
-  BLACK, WHITE, GRAY MEDIUM SAND (SW)
-  SILTY, FINE SAND AND FINE SAND (SM) WITH SILT AND SHELL FRAGMENTS
-  GRAY AND BLACK MEDIUM SAND (SW) WITH SHELL FRAGMENTS
-  SHALLOW GROUNDWATER POTENTIOMETRIC SURFACE (APPROXIMATE)



NOTES:

1. LITHOLOGY DESCRIPTION DEVELOPED FROM DATA COLLECTED AT SOIL BORING SB1000, WHICH IS LOCATED AT LC34-IW0076 IN FIGURE 3.
2. LITHOLOGY OF UPPERMOST FIVE FEET OF SOIL WAS NOT LOGGED, SINCE SOIL BORING WAS INITIALLY HAND-AUGERED TO A DEPTH OF FIVE FEET.

Generalized Lithology Cross Section at Hot Spot 1

Hot Spot 1, LC34, Cape Canaveral, FL
ESTCP Project ER-0716



Guelph

August 2010

Figure

8

4.2.2 Site Hydrology

Groundwater at the site is generally encountered at about 5 ft BLS. In the shallow island aquifer system found at LC34, surface water bodies influence groundwater flow. Two large water bodies, the Atlantic Ocean and the Banana River are located approximately 0.25 miles to the east and 1 mile west of the site, respectively. Period of record water levels indicate the primary direction of groundwater flow is directed to the coastal margins of the site with the highest recorded water levels near the area of the former ESB. At Hot Spot 1, which is south of the launch pad, groundwater flow in the shallow aquifer is predominantly to the east, toward the Atlantic Ocean. Groundwater gradients are relatively flat and in general, groundwater flow is sluggish. Groundwater elevations show some tidal influence; apparent flow reversals may occur depending on tide stage at time of groundwater gauging. Groundwater potentiometric surface maps for the shallow aquifer from the 2008 and 2009 Annual Groundwater Monitoring Reports (NASA, 2009; NASA, 2010) are shown in Figure 9.

4.2.3 Groundwater Geochemistry

Samples from selected wells at LC34, including IW0002I and IW0002D have been analyzed periodically for a suite of natural attenuation indicator parameters. Geochemical conditions in Hot Spot 1 appear to be consistent with anaerobic microbial activity, with relatively reducing redox conditions and elevated concentrations of ethane (and methane). There is about 18 mg/L of sulfate present in the groundwater. These conditions are consistent with the concentrations of cDCE and VC, which indicate that microbial reductive dechlorination is active at the site.

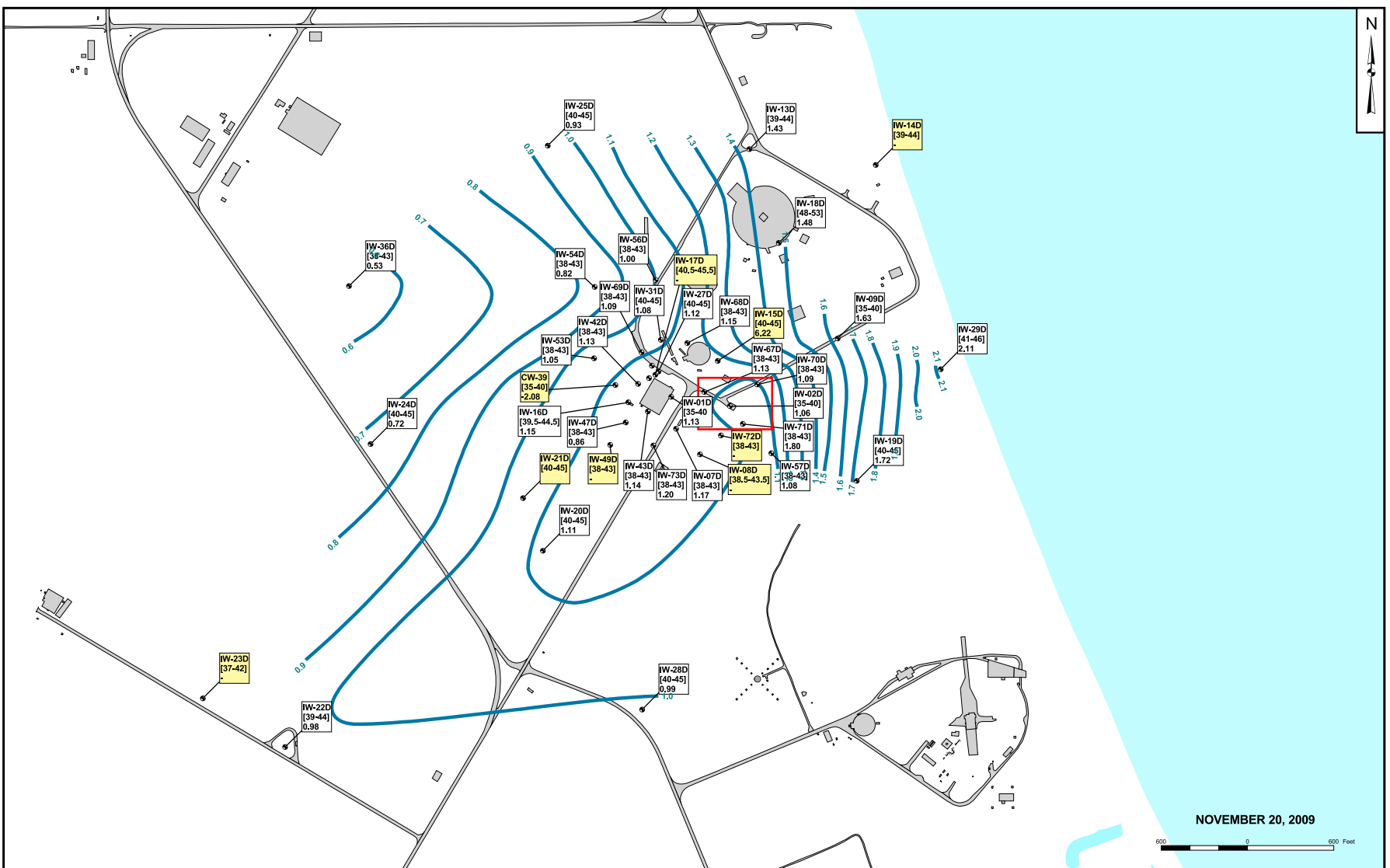
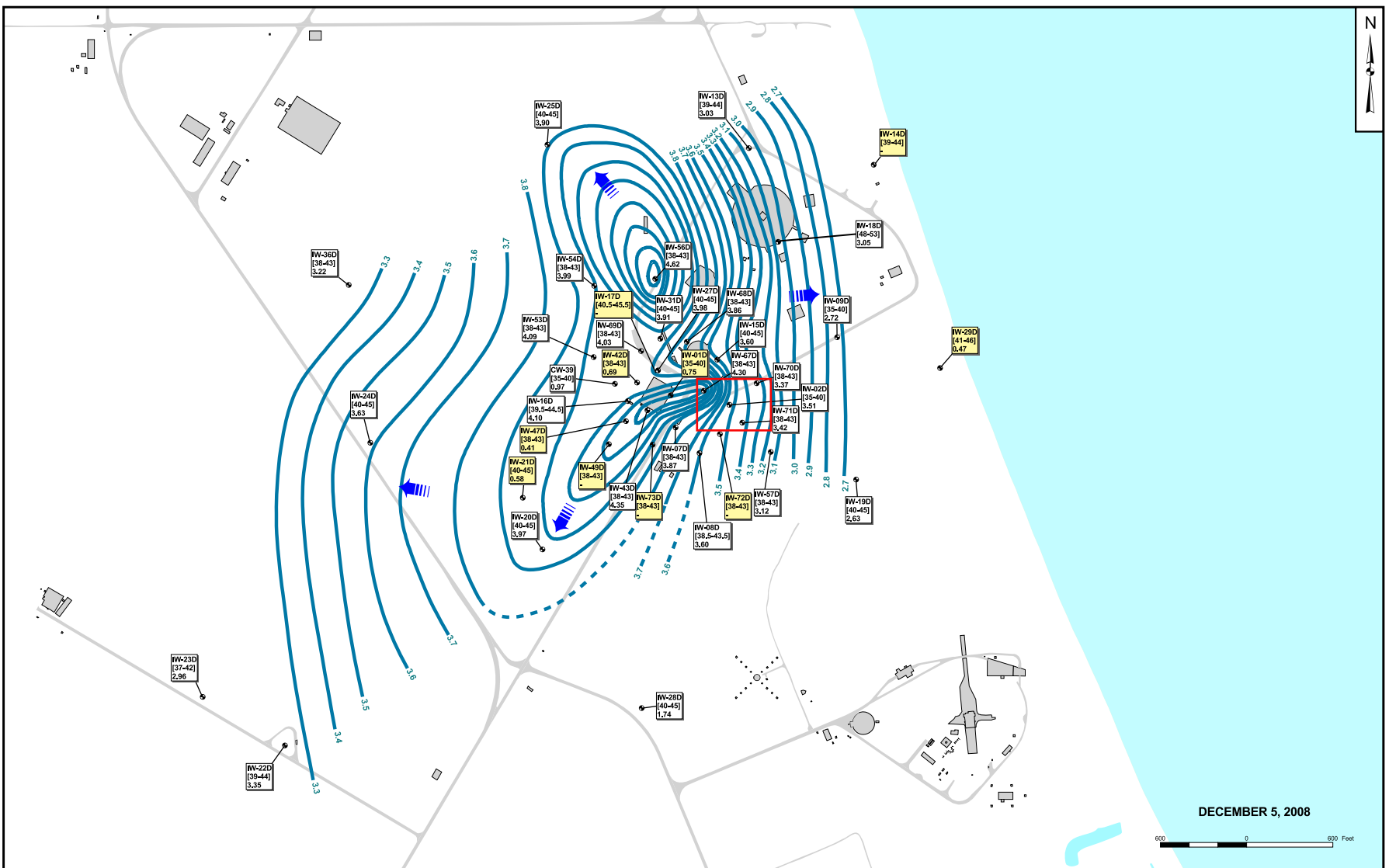
4.3 CONTAMINANT DISTRIBUTION

The Hot Spot 1 source mass, while a distinct source from that delineated beneath the ESB, is situated within the large VOC plume around the ESB. As a result, there are elevated levels of cDCE and VC that may not originate from the TCE in Hot Spot 1. The Hot Spot 1 TCE plume has been delineated to a concentration of 300 µg/L; below this concentration the plumes are difficult to separate on the map due to comingling of the plumes. For the breakdown products (cDCE and VC), separation is not possible. Although no other VOCs were identified in groundwater during prior routine monitoring of the existing monitoring wells, CFC113 was present at several locations in the upper aquifer at concentrations up to 130,000 µg/L.






VOC impacts in the Hot Spot 1 Area were delineated from 2008 to 2009 through a series of direct-push groundwater sampling events, a membrane interface probe (MIP) investigation, saturated zone soil sampling and installation and sampling of a deep monitoring well (screen interval of 70 to 80 ft BLS). MIP results were used in conjunction with the concentration data to define the vertical interval of VOC-impacted groundwater, which was deemed to be the 30 to 60 ft BLS interval for the PED DEM/VAL.

The CMS for the site (NASA, 2007) presents theoretical soil concentrations for TCE-DNAPL saturation; a value of about 300 mg/kg is considered representative of NAPL-phase TCE, using literature values for TCE solubility and organic carbon partition coefficient (K_{oc}), assumed values of bulk density and porosity, and measured values of the fraction of organic carbon (f_{oc}). The maximum value measured, 56.2 mg/kg^{dry}, which is equivalent to 42.7 mg/kg in the bulk, is about 14% of the theoretical threshold value.; hence, DNAPL is inferred to be present in the plot based on this result together with the groundwater concentrations.

The groundwater concentrations are indicative of a TCE-NAPL source: the source has been there for over 40 years and concentrations of TCE are still about 30,000 μ g/L based on groundwater samples from the monitoring wells and DPT samples in the middle of the Hot Spot 1 area.



Legend

-  Monitoring Well Location
 -  Piezometer Location
 -  Potentiometric Contour in feet above MSL (0.1 foot interval) (Dashed Where Inferred)
 -  Groundwater Flow Direction
 -  Hot Spot 1 Area
- | | | |
|---------|---|---|
| PZ-01 | ← | Local Designation |
| [17-22] | ← | Screen Interval in feet below ground surface |
| 2.62 | ← | Groundwater Elevation in feet above MSL |
| IW-12S | | Anomalous Water Level - Not Used For Contouring |
| [0.83] | | |

Notes:

1. Maps from LC34 Annual Groundwater Monitoring Reports (NASA 2009, 2010).
2. Potentiometric surface applies to the 30 to 45 ft BLS interval, referred to as Layer 3 or the "D" zone.

Groundwater Potentiometric Surface Maps
Launch Complex 34, Cape Canaveral
ESTCP Project ER-0716

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August 2010

Figure
9

5 TEST DESIGN

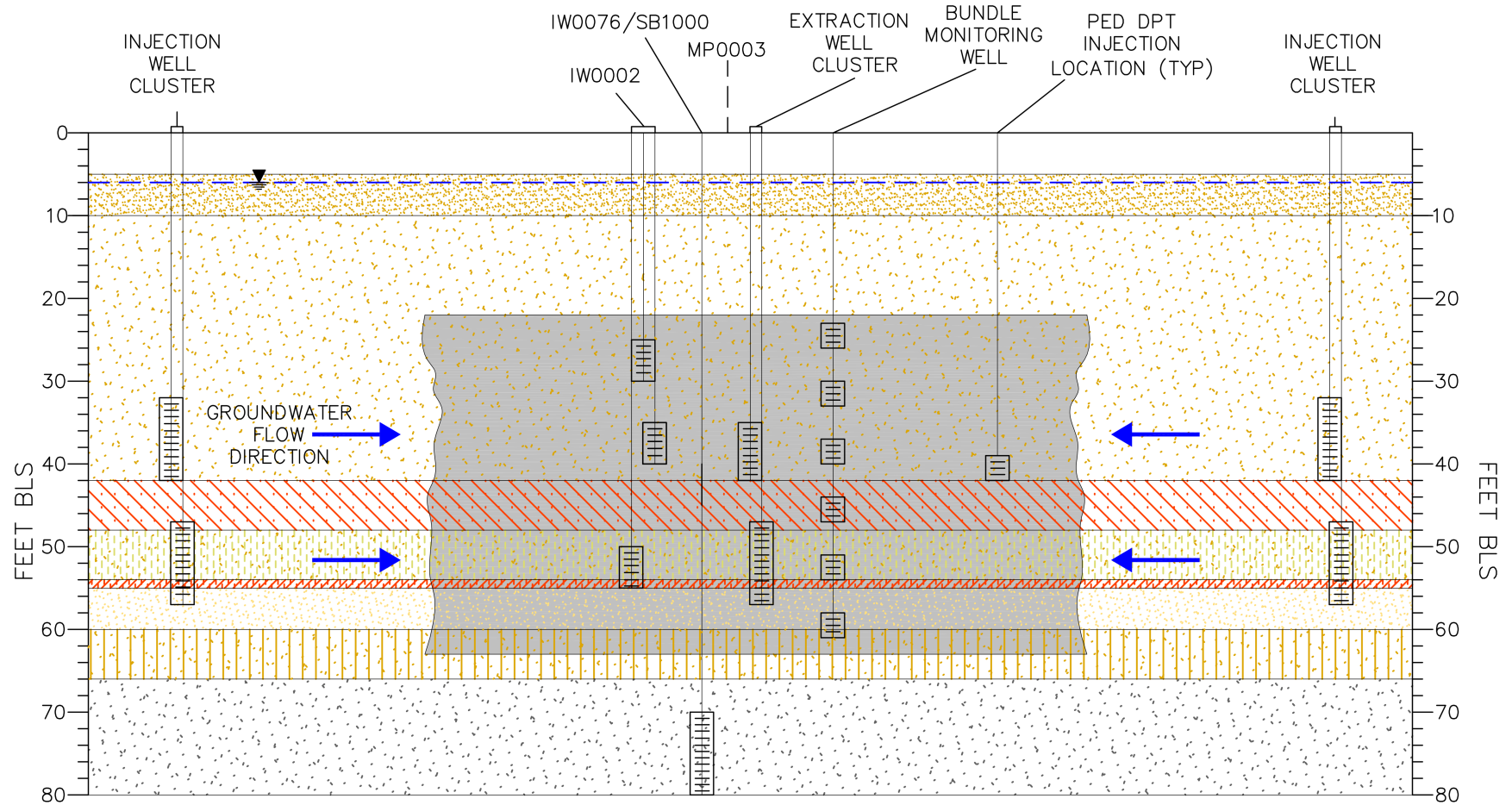
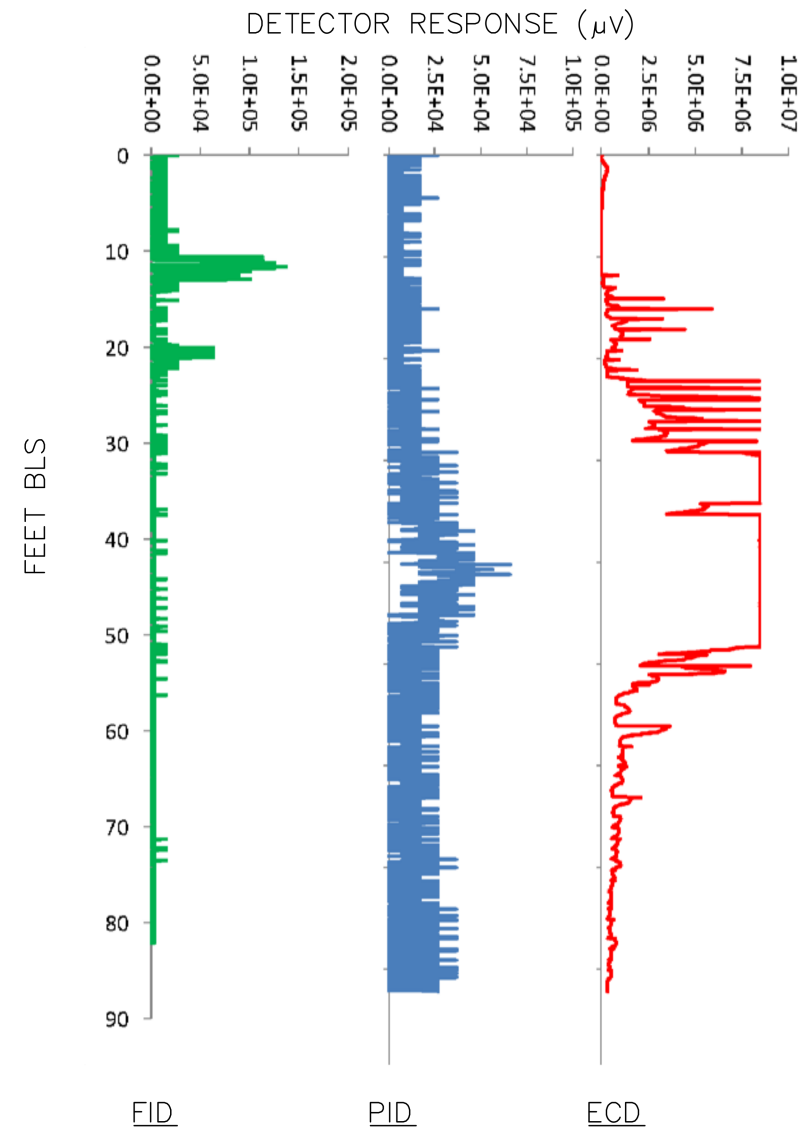
5.1 CONCEPTUAL EXPERIMENTAL DESIGN

The objective of this project was to demonstrate the application of a PED at a DNAPL source zone site to improve the biologically-enhanced dissolution rate of DNAPL over that which can be achieved with soluble, non-partitioning electron donors. The overarching goal was to demonstrate that PED application offered increased bioremediation efficiency and decreased implementation costs.

The PED technology was demonstrated at a source zone hot spot wherein TCE DNAPL is associated with a silty sand/silty clay horizon at about 42 to 48 ft BLS and TCE concentrations up to 141,000 $\mu\text{g/L}$ had been reported. Figure 10 shows a cross section of the demonstration area. The hot spot was amended with PED nBA above, within and below this low permeability horizon. Two sweep zones, one above and one below the clay horizon were separately instrumented and operated, providing two data sets with which to evaluate the performance of the PED technology. Each sweep zone was instrumented with a single central extraction well, from which integrated groundwater samples were collected routinely to monitor the average concentration of various dissolved constituents over time. Extracted groundwater was returned to the aquifer through a set of ten groundwater injection wells on the perimeter of the TCE plume. At each of five injection locations, a pair of injection wells was installed, above and below the clay horizon, to help create an inward hydraulic gradient and promote horizontal flow across the top and base of the clay horizon.

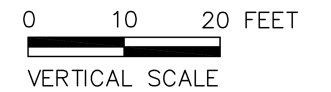
Each extraction well operated, at a relatively low flow rate, to maintain an inward hydraulic gradient and collect representative groundwater from the aquifer on either side of the clay horizon. The extracted groundwater was analyzed for VOCs to establish the baseline flux of VOCs. Once baseline conditions were established, the zone was amended with electron donor (nBA) and conservative tracers (bromide and iodide) using DPT injection to deliver the amendments throughout the target zone. This approach delivered the amendment solution throughout the pore volume of the plot all at once, rather than relying on advective transport in a recirculation mode, and allowed the amendments to be preferentially delivered to the clay layer and the portions of the overlying and underlying aquifers where residual DNAPL may occur. A shut-in period, with no groundwater extraction, was then observed, to allow native microbes to acclimate to the nBA and allow biomass to become established within the demonstration area. Following this, soil and groundwater samples were collected to establish the distribution of electron donor and tracer within each demonstration area.

MP0003 RESULTS



LEGEND

- GRAY, TAN, BROWN FINE SAND (SP) WITH SHELL FRAGMENTS
- GRAY FINE SAND (SP) WITH SHELL FRAGMENTS
- GRAY SILTY SAND AND SILTY CLAY (CL) WITH SHELL FRAGMENTS
- GRAY FINE SAND (SP) WITH SHELL FRAGMENTS AND SILT
- GRAY SILTY CLAY (CL)
- BLACK, WHITE, GRAY MEDIUM SAND (SW)
- SILTY, FINE SAND AND FINE SAND (SM) WITH SILT AND SHELL FRAGMENTS
- GRAY AND BLACK MEDIUM SAND (SW) WITH SHELL FRAGMENTS
- PED AMENDMENT ZONE
- SHALLOW GROUNDWATER POTENTIOMETRIC SURFACE (APPROXIMATE)
- SCREENED INTERVAL



NOTES:

1. BLS INDICATES BELOW LAND SURFACE.
2. MP INDICATES MEMBRANE INTERFACE PROBE.
3. FID INDICATES FLAME IONIZATION DETECTOR.
4. PID INDICATES PHOTOIONIZATION DETECTOR.
5. ECD INDICATES ELECTRON CAPTURE DETECTOR.
6. PED PARTITIONING ELECTRON DONOR.
7. MV INDICATES MICROVOLTS.
8. DPT INDICATES DIRECT PUSH TECHNOLOGY.
9. LITHOLOGY DESCRIPTION DEVELOPED FROM DATA COLLECTED AT SOIL BORING SB1000.
10. INJECTION WELL CONSTRUCTION DETAILS PROVIDED ON FIGURE B-2 (APPENDIX B).
11. EXTRACTION WELL CONSTRUCTION DETAILS PROVIDED ON FIGURE B-1 (APPENDIX B).
12. BUNDLE MONITORING WELL CONSTRUCTION DETAILS PROVIDED ON FIGURE B-3 (APPENDIX B).
13. CROSS SECTION IS SCHEMATIC; DOES NOT CORRESPOND TO A PARTICULAR SECTION LINE.

Cross-Sectional View of PED Demonstration Layout

Hot Spot 1, LC34, Cape Canaveral, FL
ESTCP Project ER-0716

Geosyntec
consultants

Guelph

July 2013

Figure

10

Following the biomass growth shut-in period, groundwater extraction was re-initiated, with routine sample collection to assess the concentrations and flux of various compounds. Comparison of concentrations (VOCs, PED, tracers) in groundwater initially and over time extracted from the central wells will assess the “disturbance effect” of direct injection and evaluate the quantity of PED that was taken up by NAPL, sorbed or diffused into secondary porosity of the formation (where the NAPL also likely resides). Trends in the concentrations of various dissolved constituents in extracted water over time were used to understand changes in the flux of VOCs (and amended compounds). Soil sampling was conducted before (baseline delineation) and after the demonstration area was amended, to establish mass distribution within the plots, and again after operation was halted, to assess changes over the DEM/VAL operation and correlate these results with the observed trends in groundwater concentrations.

Both sweep zones were monitored throughout the course of the demonstration (March 2011 to February 2012), to evaluate system performance and evaluate whether laboratory assessment data are useful to predict PED performance under field conditions. The performance was assessed in terms of VOC mass flux enhancement and compared with previous studies using typical, non-partitioning, soluble electron donors such as lactate.

5.2 BASELINE CHARACTERIZATION

VOC impacts in the source zone (Hot Spot 1 Area) were delineated from 2008 to 2009 through a series of direct-push groundwater sampling events, a MIP investigation, saturated zone soil sampling and installation and sampling of a deep monitoring well (screen interval of 70 to 80 ft BLS). Sampling locations are shown in Figure 11. Figure 12 shows TCE concentration isopleths in Hot Spot 1 for the depth interval from 30 to 60 ft BLS. This figure presents dissolved-phase TCE concentrations from both direct-push groundwater grab samples and from permanent monitoring wells prior to the PED DEM/VAL. MIP results were used in conjunction with the concentration data to define the vertical interval of VOC-impacted groundwater, which was deemed to be the 30 to 60 ft BLS interval for the PED DEM/VAL.

Soil samples were collected in the Hot Spot 1 area during sonic drilling to install a deep monitoring well (IW0076, screen interval from 70 to 80 ft BLS) proximal to IW0002D and MIP0003 (refer to Figure 6). Continuous core was collected and logged to a depth of 80 ft BLS. Six discrete saturated zone soil samples (5 g each) were collected to assess TCE concentrations above, in and below the clay confining layer. The results were presented in the Technology Demonstration Plan (TDP); Lebrón and Major, 2011). The TCE mass distribution was consistent with the MIP logs and groundwater data, as shown in Figure 12.



Legend

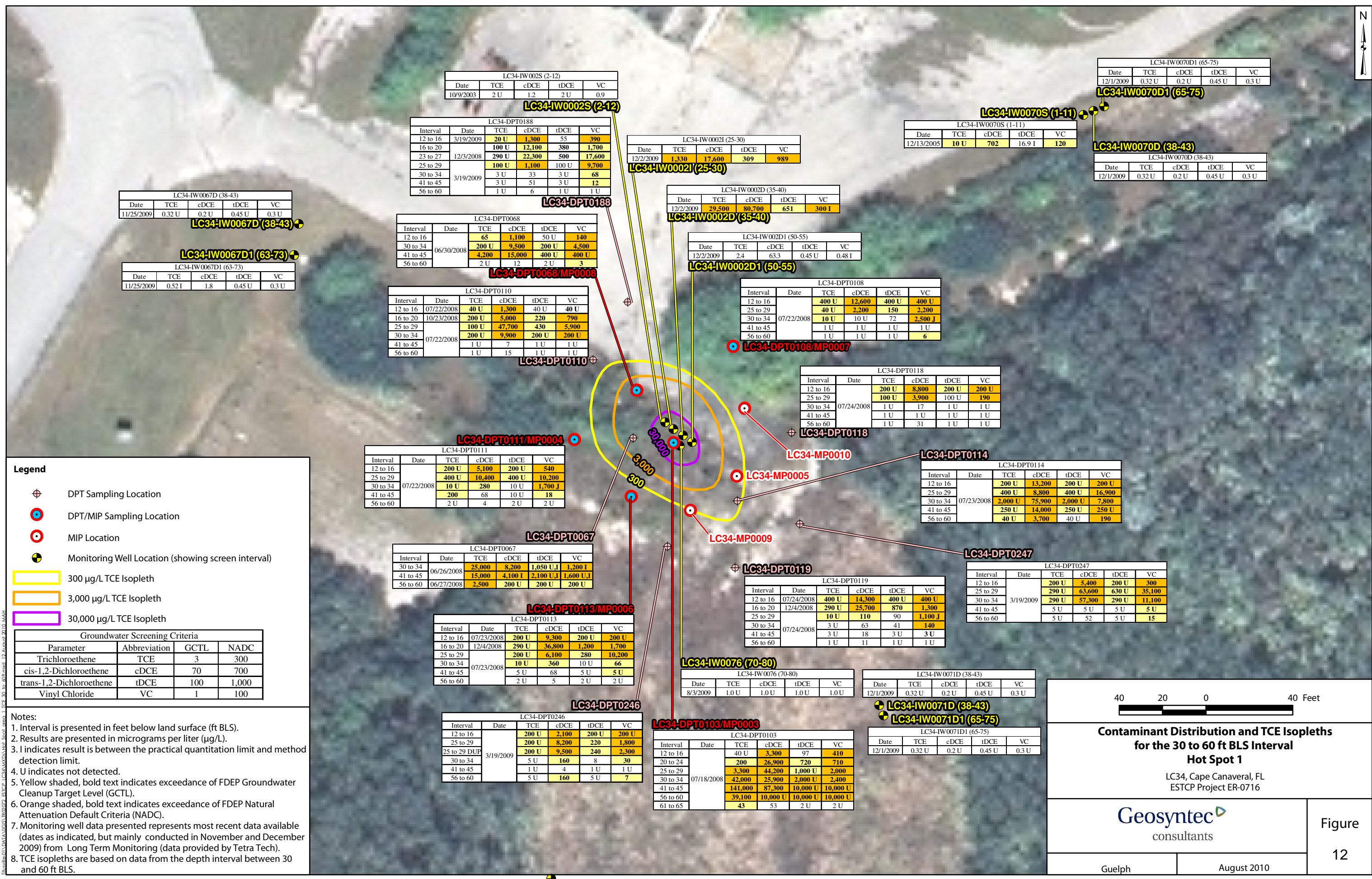
- DPT Sampling Location
- MIP Location
- DPT/MIP Sampling Location
- Soil Boring Location
- Monitoring Well Location (showing screen interval (ft BLS))

Notes:

1. ft BLS indicates feet below land surface.
2. MIP indicates Membrane Interface Probe.
3. DPT indicates Direct Push Technology.

<p>Sampling Locations Hot Spot 1</p> <p>LC34, Cape Canaveral, FL ESTCP Project ER-0716</p>	
Guelph	August 2010
<p>Figure ##</p>	

I:\Projects\LC34\GIS\Map_Series\LC34_IW0071D1_Series.mxd 03/11/2010 10:10 AM



LC34-IW0067D (38-43)

Date	TCE	cDCE	tDCE	VC
11/25/2009	0.32 U	0.2 U	0.45 U	0.3 U

LC34-IW0067D1 (63-73)

Date	TCE	cDCE	tDCE	VC
11/25/2009	0.52 I	1.8	0.45 U	0.3 U

LC34-IW002S (2-12)

Date	TCE	cDCE	tDCE	VC
10/9/2003	2 U	1.2	2 U	0.9

LC34-DPT0188

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16	3/19/2009	20 U	1,300	55	390
16 to 20		100 U	12,100	380	1,700
23 to 27	12/3/2008	290 U	22,300	500	17,600
25 to 29		100 U	1,100	100 U	9,700
30 to 34	3/19/2009	3 U	33	3 U	68
41 to 45		3 U	51	3 U	12
56 to 60		1 U	6	1 U	1 U

LC34-DPT0068

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		65	1,100	50 U	140
30 to 34	06/30/2008	200 U	9,500	200 U	4,500
41 to 45		4,200	15,000	400 U	400 U
56 to 60		2 U	12	2 U	3

LC34-DPT0110

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16	07/22/2008	40 U	1,300	40 U	40 U
16 to 20	10/23/2008	200 U	5,000	220	790
25 to 29		100 U	47,700	430	5,900
30 to 34	07/22/2008	200 U	9,900	200 U	200 U
41 to 45		1 U	7	1 U	1 U
56 to 60		1 U	15	1 U	1 U

LC34-DPT0111

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		200 U	5,100	200 U	540
25 to 29		400 U	10,400	400 U	10,200
30 to 34	07/22/2008	10 U	280	10 U	1,700 J
41 to 45		200	68	10 U	18
56 to 60	2 U	4	2 U	2 U	

LC34-DPT0067

Interval	Date	TCE	cDCE	tDCE	VC
30 to 34	06/26/2008	25,000	8,200	1,050 U,I	1,200 I
41 to 45		15,000	4,100 I	2,100 U,I	1,600 U,I
56 to 60	06/27/2008	2,500	200 U	200 U	200 U

LC34-DPT0113

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16	07/23/2008	200 U	9,300	200 U	200 U
16 to 20	12/4/2008	290 U	36,800	1,200	1,700
25 to 29		200 U	6,100	280	10,200
30 to 34	07/23/2008	10 U	360	10 U	66
41 to 45		5 U	68	5 U	5 U
56 to 60		2 U	5	2 U	2 U

LC34-DPT0246

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		200 U	2,100	200 U	200 U
25 to 29		200 U	8,200	220	1,800
25 to 29 DUP	3/19/2009	200 U	9,500	240	2,300
30 to 34		5 U	160	8	30
41 to 45		1 U	4	1 U	1 U
56 to 60		5 U	160	5 U	7

LC34-IW0002I (25-30)

Date	TCE	cDCE	tDCE	VC
12/2/2009	1,330	17,600	309	989

LC34-IW0002D (35-40)

Date	TCE	cDCE	tDCE	VC
12/2/2009	29,500	80,700	651	300 I

LC34-IW0002D1 (50-55)

Date	TCE	cDCE	tDCE	VC
12/2/2009	2.4	63.3	0.45 U	0.48 I

LC34-DPT0108

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		400 U	12,600	400 U	400 U
25 to 29		40 U	2,200	150	2,200
30 to 34	07/22/2008	10 U	10 U	72	2,500 J
41 to 45		1 U	1 U	1 U	1 U
56 to 60		1 U	1 U	1 U	6

LC34-DPT0118

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		200 U	8,800	200 U	200 U
25 to 29		100 U	3,900	100 U	190
30 to 34	07/24/2008	1 U	17	1 U	1 U
41 to 45		1 U	1 U	1 U	1 U
56 to 60		1 U	31	1 U	1 U

LC34-DPT0114

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		200 U	13,200	200 U	200 U
25 to 29		400 U	8,800	400 U	16,900
30 to 34	07/23/2008	2,000 U	75,900	2,000 U	7,800
41 to 45		250 U	14,000	250 U	250 U
56 to 60		40 U	3,700	40 U	190

LC34-DPT0247

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		200 U	5,400	200 U	300
25 to 29		290 U	63,600	630 U	35,100
30 to 34	3/19/2009	290 U	57,300	290 U	11,100
41 to 45		5 U	5 U	5 U	5 U
56 to 60		5 U	52	5 U	15

LC34-IW0076 (70-80)

Date	TCE	cDCE	tDCE	VC
8/3/2009	1.0 U	1.0 U	1.0 U	1.0 U

LC34-IW0071D (38-43)

Date	TCE	cDCE	tDCE	VC
12/1/2009	0.32 U	0.2 U	0.45 U	0.3 U

LC34-IW0071D1 (65-75)

Date	TCE	cDCE	tDCE	VC
12/1/2009	0.32 U	0.2 U	0.45 U	0.3 U

LC34-DPT0103

Interval	Date	TCE	cDCE	tDCE	VC
12 to 16		40 U	3,300	97	410
20 to 24		200	26,900	720	710
25 to 29		3,300	44,200	1,000 U	2,000
30 to 34	07/18/2008	42,000	25,900	2,000 U	2,400
41 to 45		141,000	87,300	10,000 U	10,000 U
56 to 60		39,100	10,000 U	10,000 U	10,000 U
61 to 65		43	53	2 U	2 U

Legend

- DPT Sampling Location
- DPT/MIP Sampling Location
- MIP Location
- Monitoring Well Location (showing screen interval)
- 300 µg/L TCE Isopleth
- 3,000 µg/L TCE Isopleth
- 30,000 µg/L TCE Isopleth

Groundwater Screening Criteria			
Parameter	Abbreviation	GCTL	NADC
Trichloroethene	TCE	3	300
cis-1,2-Dichloroethene	cDCE	70	700
trans-1,2-Dichloroethene	tDCE	100	1,000
Vinyl Chloride	VC	1	100

- Notes:**
- Interval is presented in feet below land surface (ft BLS).
 - Results are presented in micrograms per liter (µg/L).
 - I indicates result is between the practical quantitation limit and method detection limit.
 - U indicates not detected.
 - Yellow shaded, bold text indicates exceedance of FDEP Groundwater Cleanup Target Level (GCTL).
 - Orange shaded, bold text indicates exceedance of FDEP Natural Attenuation Default Criteria (NADC).
 - Monitoring well data presented represents most recent data available (dates as indicated, but mainly conducted in November and December 2009) from Long Term Monitoring (data provided by Tetra Tech).
 - TCE isopleths are based on data from the depth interval between 30 and 60 ft BLS.

40 20 0 40 Feet

Contaminant Distribution and TCE Isopleths for the 30 to 60 ft BLS Interval Hot Spot 1

LC34, Cape Canaveral, FL
ESTCP Project ER-0716

Geosyntec consultants

Guelph August 2010

Figure 12

This soil sampling was performed to evaluate the vertical concentration variations in the area, not to define the highest concentration of TCE at the site. Soil samples were intended to illustrate the depth interval where most of the TCE mass was located. The well was installed to confirm that the total depth of contamination was understood (and groundwater from the 70 to 80 ft BLS screen interval confirmed that VOCs were not present at that depth).

The CMS for the site (NASA, 2007) present theoretical soil concentrations for TCE-DNAPL saturation; a value of about 300 mg/kg is considered representative of NAPL-phase TCE. This value was determined using literature values for TCE solubility and organic carbon partition coefficient (K_{oc}), assumed values of bulk density and porosity, and measured values of the fraction of organic carbon (f_{oc}) for the site. The maximum TCE-DNAPL saturation value measured was 56.2 mg/kg^{dry}, which is equivalent to 42.7 mg/kg in the bulk soil. This would represent about 14% of the theoretical threshold value. On this basis the CMS concluded that DNAPL is likely present in the Hot Spot 1 area.

The groundwater concentrations are also indicative of a TCE-NAPL source: the source has been there for over 40 years and concentrations of TCE are still about 30,000 µg/L based on groundwater samples from the monitoring wells and DPT samples in the middle of the Hot Spot 1 area.

5.3 TREATABILITY OR LABORATORY STUDY RESULTS

A Laboratory Treatability Report (NAVFAC ESC et al., 2010) was prepared for the ESTCP review committee to present the results of the Laboratory Treatability Testing conducted as part of ESTCP project ER-0716. Laboratory treatability studies were conducted to evaluate candidate PEDs for eventual field application as part of the project. Based on prior research, consideration of physical-chemical properties, material costs, and toxicity, two candidate PEDs, nBA and nHEX, were selected for evaluation for enhanced microbial reductive dechlorination of TCE-NAPL.

The experiments conducted included:

- (i) PED-NAPL Partitioning Studies to assess key physical-chemical parameters that are important for successful field implementation and included liquid-liquid equilibrium batch studies and mass transfer column experiments (abiotic columns);
- (ii) Bench-Scale Treatability experiments to obtain site-specific design parameters for PED delivery, mass transfer, and enhanced microbial reductive dechlorination activity in a TCE-DNAPL source zone. These tests were designed to evaluate mass transfer of the partitioning electron donor and potential microbial activity under anticipated field conditions, and ultimately to demonstrate that the PED enhances reductive dechlorination activity and DNAPL dissolution rates.

Liquid-liquid equilibrium batch tests indicated that the partitioning behavior of both candidate PEDs (nHEX and nBA) could be characterized by ideal linear partitioning theory over the range of aqueous concentrations likely to be used in a field application (i.e. using initial dissolved-phase concentrations approaching aqueous solubility of the PED). Results demonstrated that based on partitioning coefficients nBA would partition more strongly into the NAPL than the nHEX. nBA was then selected for the field application. Abiotic column experiments further characterized the partitioning behavior of both candidate PEDs under flowing conditions in a well-characterized aquifer material (Federal Fine Ottawa sand). Tests were performed at a range of seepage velocities (1.2 to 6.0 meters per day [m/day]) in columns containing entrapped residual TCE-NAPL. Comparison of the column effluent breakthrough curves (BTCs) to predictions based on the one-dimensional advective-dispersive-reactive (ADR) transport equation indicated that PED partitioning occurred, but was not at equilibrium. The BTCs were fit with a 1-D ADR transport equation that incorporated a one-site solute non-equilibrium partitioning model. This model allowed calculation of a NAPL:water partitioning coefficient (K_{nw}), PED retardation factor (R_F) and a first-order mass transfer coefficient (k). The resulting data showed that nBA had a greater partitioning coefficient (and hence greater retardation factor) and slower mass-transfer rate than nHEX. The results confirmed the strong partitioning of nBA into TCE-NAPL. The results from these abiotic studies were published by Cápiro et al. (2011).

The strong partitioning of nBA into TCE- and surrogate-NAPL suggested that a single injection of PED solution was capable of providing electron donor to support microbial reductive dechlorination far beyond the number of PVs delivered, thereby reducing the need for frequent or repeated PED injections, independent of groundwater velocity. On this basis, nBA was selected as the PED for use in the bench scale biological treatability evaluation.

Microbial batch studies confirmed the efficacy of nBA as the electron donor to support the KB-1[®] Plus consortium to dechlorinate TCE and 1,1,1-trichloroethane (1,1,1-TCA). The results indicated that the KB-1[®] Plus consortium was able to degrade nBA and utilize it as an electron donor for dechlorination of TCE and 1,1,1-TCA. In these batch tests, the nBA-amended systems removed TCE and 1,1,1-TCA at dissolved concentrations of 5 mg/L over the same time period as the soluble methanol-ethanol-lactate (MEL) electron donor blend. Similarly positive results were obtained in systems containing surrogate NAPL and correspondingly high dissolved phase concentrations of TCE and 1,1,1-TCA (about 200 mg/L each). Results from the batch studies suggested that nBA would be a suitable PED for deployment in the field, based on the physical-chemical partitioning characteristics and the observed utility as an electron donor.

5.4 DESIGN AND LAYOUT OF TECHNOLOGY COMPONENTS

A primary objective of the project was to make the application of a PED similar to existing direct push injection approaches. The purpose of using a PED in place of a traditional electron donor was to maximize the bioremediation efficiency and improve the DNAPL dissolution rate, while minimizing implementation costs associated with the application of EISB in DNAPL source

zones. As such, the quantitative performance objectives established were to assess the PED application impact on primary parameters such as increased DNAPL dissolution (i.e. increased total VOC mass flux) and reduction in DNAPL mass. It was assumed that the application of PEDs would cost much the same as conventional donors on a per-application basis (for example, delivery using standard direct-push injection equipment from vendors), hence, if PEDs were effective longer (i.e., persisting longer results in less frequent donor amendment) and/or shorten remediation time frames, it would lower overall O&M costs. Therefore some components and tasks during the DEM/VAL were meant to assess the objectives and will not necessarily be required in future applications.

The system components included:

- extraction of groundwater from the center of the treatment area from extraction wells screened above and below the clay layer;
- injection of groundwater into injection wells screened above and below the clay layer surrounding treatment area;
- recirculation of site groundwater using a solar powered recirculation system;
- evaluation of mass flux without nBA enhancement by measuring VOC concentrations in samples from extraction wells (granular activated carbon [GAC] used to treat groundwater before reinjection during this phase) before nBA injection;
- injection of nBA using DPT into interval above and below the clay layer; and
- continued recirculation (no GAC treatment) and evaluation of mass flux and enhanced bioremediation using nBA by measuring VOC concentrations in samples from site monitoring wells and site soil samples.

For the field site the DEM/VAL was conducted in two zones, one above and one below the clay horizon. For this study these have been termed sweep zones as these are the areas where treatment is targeted. For each sweep zone, a groundwater recirculation system consisting of a central extraction well and five peripheral injection (recharge) wells was constructed to move groundwater through the PED-amended zone and maintain hydraulic control within the DEM/VAL area (Figure 13). The recirculation systems utilized solar-powered submersible pumps. The system components were housed in a mobile trailer, with the solar panels mounted to the roof. To supplement the existing monitoring wells, three multilevel monitoring well bundles were installed within the demonstration area at varying distances from the central extraction location. A schematic cross section of the DEM/VAL plot is provided in Figure 10, showing the locations of the well screens relative to the site lithology and the MIP data from the IW0076 location. Figure 14 shows the process flow diagram for the groundwater recirculation system.

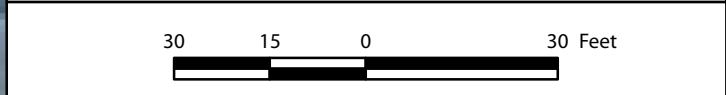


Legend

- Bundle Well Location
- Monitoring Well Location
- Monitoring Well Location - Not Part of Sampling Plan
- Extraction Well Location
- Injection Well Pair Location

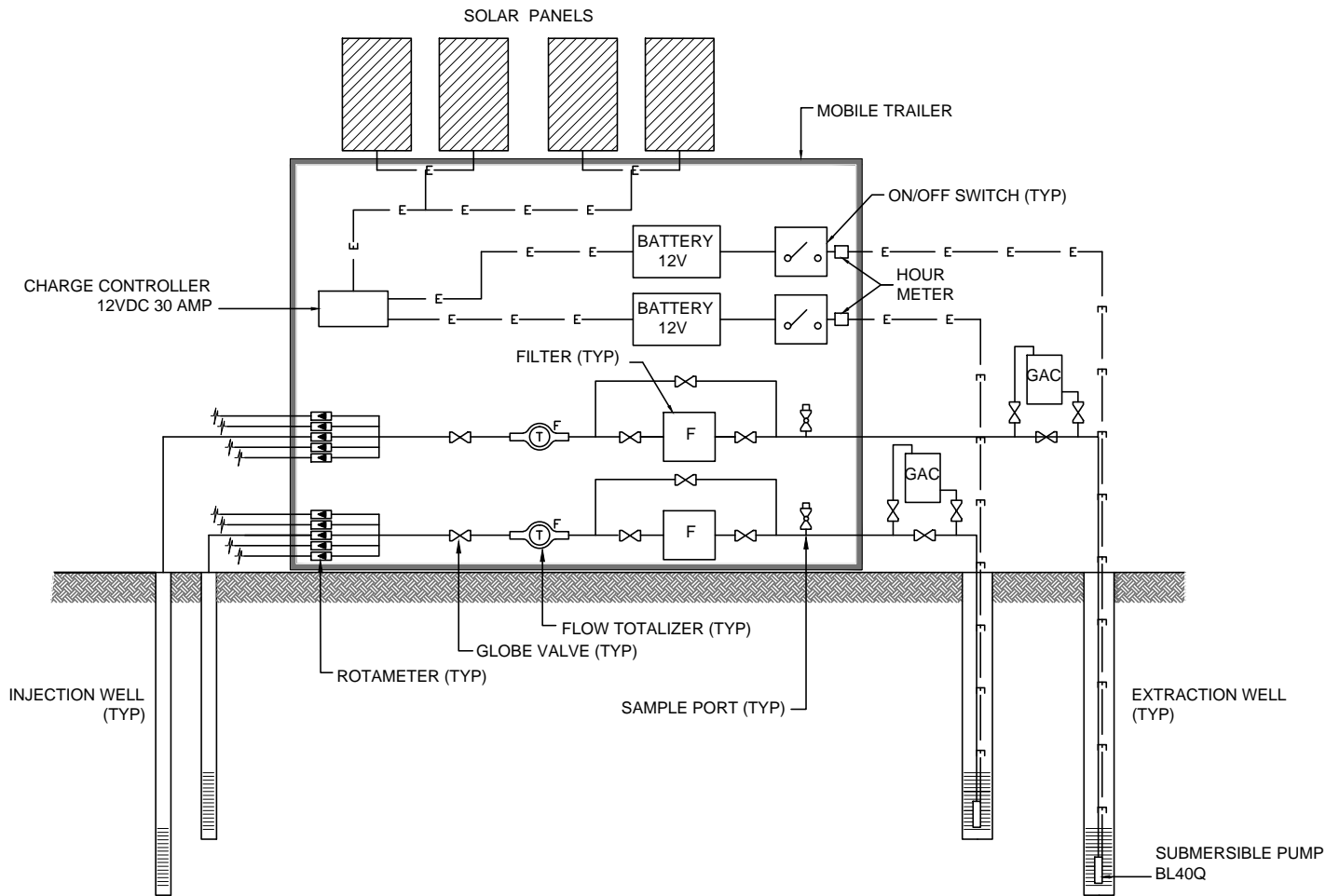
Well Identifier Screen Interval (ft BLS)

Note:
ft BLS indicates feet below land surface.



Plan View of PED Demonstration Layout
Hot Spot 1, LC34, Cape Canaveral, FL / ESTCP Project ER-0716

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NOT TO SCALE

LEGEND

————— GROUNDWATER RECIRCULATION LINES

— E — E — ELECTRICAL LINES

NOTE:

1. GRANULAR ACTIVATED CARBON (GAC) WAS ONLY USED DURING THE BASELINE FLUX ASSESSMENT PHASE (REFER TO TEXT).

Process and Instrumentation Diagram

Hot Spot 1, LC34 Cape Canaveral, FL
ESTCP Project ER-0716



Figure

14

Guelph

April 2013

Appendix B contains a summary of the well installation details. All borehole drilling and well installation was performed by a State-licensed driller, Environmental Drilling Services, Inc. (EDS), under the direction of a Geosyntec field geologist.

The groundwater recirculation system was installed in February 2011. It consisted of a mobile utility trailer that housed the system components and piping that carried the flow of groundwater from the extraction wells to the trailer and then to the injection wells. Parallel independent groundwater recirculation systems were operated for each of the upper and lower sweep zones. It should be noted that the recirculation system is not a requirement for application of the PED, but that for DEM/VAL it provided a controlled manner to assess performance. For each sweep zone, groundwater is pumped from the central extraction well and delivered to the five perimeter injection wells. A process and instrumentation diagram (P&ID) is presented on Figure 14. Appendix C contains a summary of the system operation details and supporting information.

The recirculation piping system was constructed using 0.75-inch diameter polyethylene (PE) tubing. The lines were run above-ground, enclosed in 2-inch diameter schedule 40 PVC for secondary containment. The upper and lower sweep zones had independent recirculation systems, with no mixing of fluid from one zone to the other. Submersible pressure transducers and data loggers were deployed in the extraction wells, six injection wells and two monitoring wells to measure and record water level fluctuations during system operation.

During the initial groundwater recirculation phase to establish baseline concentrations and mass flux, extracted groundwater was treated with GAC prior to re-injection. The GAC vessels were plumbed into the system so that extracted groundwater was treated before it entered the trailer and the flow was divided (see Figure 14).

The PED and conservative tracers (bromide and iodide) were amended throughout the DEM/VAL plot via a set of 20 DPT injection locations. This approach was selected to achieve better initial distribution of the PED throughout the target area, rather than amending recirculated groundwater. A licensed contractor with experience in DPT injection of bioremediation amendments was subcontracted to perform the injections. Equipment, specified and supplied by the contractor, included the following: DPT rod; injection tools (one capable of focused delivery to a 2-ft interval, one a 5-ft interval); pumps capable of supplying the required flow rates and injection pressures; manifolds with valves, pressure gauges and flow meters to measure and control the achieved flow rate and pressure at each location; and batch mix tanks, with requisite mixers and valves to ensure proper blending of the amendment fluids prior to injection. The instantaneous flow rate, injection pressure and the totalized flow rate were monitored and recorded during each injection event. The PED injection is discussed below (Section 5.5) and in Appendix C.

The target depth interval spanned an approximately 40 ft thick zone from about 23 to 63 ft BLS, encompassing the clay horizon within which TCE concentrations were elevated. The amendment zone included about 19 ft above the clay horizon, 6 ft within the clay, and about 15 ft

beneath the clay horizon. At each location, the injections were conducted in a series of steps, starting at the top of the target interval and working downwards. Injections mostly used a 2-ft injection tool to allow control of the delivery of amendment to targeted intervals; at a few locations a 5-ft injection tool was used.

The design involved injection of 34,000 gal of nBA solution (3,000 mg/L). This volume was selected to be approximately 50% of the total pore volume of the target zone. The amendment zone targeted the center of the Hot Spot 1 area, where TCE concentrations were greatest, roughly corresponding with the area enclosed by the 30,000 µg/L TCE isopleth and extending beyond that by approximately 5 ft in all directions (refer to Figure 12).

Two (2) conservative tracers were added to PED injection fluids. Bromide was used as a conservative tracer in all injection fluids, to provide an indicator of amended fluid; the concentration of bromide would indicate the proportion of injectate in any sample. Iodide was added as a tracer only in the injection fluids introduced above the confining silty clay horizon. The iodide was used to monitor for potential migration of fluid from the upper treatment zone through the clay to the lower zone, which could have occurred as a result of maintaining a lower hydraulic head in the lower zone.

Following PED injection, the recirculation system remained off for a period of six weeks to allow the PED to partition into NAPL within the demonstration area and to facilitate the acclimation and establishment of biomass within the demonstration area. Groundwater extraction during this 'shut-in' phase was undesirable, since it might have removed much of the amended nBA and re-injected it on the periphery. At the end of this Biomass Growth Phase, the distribution of PED and VOCs within the demonstration area was assessed through DPT soil sampling and a synoptic survey of groundwater concentrations.

After biomass growth phase was complete the groundwater recirculation system was activated. Recirculation of groundwater occurred for approximately thirteen months. During this time routine sample events took place to evaluate the effectiveness of the PED injection.

5.5 FIELD TESTING

The field DEM/VAL was implemented in accordance with the Demonstration Plan. Implementation of the experimental design consisted of seven main tasks as follows:

- a. Installation and Shake Down (Task 1);
- b. Baseline Soil and Groundwater Sampling (Task 2);
- c. Baseline Flux Assessment (Task 3);
- d. Introduction of PED and Tracers (Task 4);
- e. Biomass Growth (Task 5);
- f. Recirculation System Operation (Task 6); and
- g. Demobilization (Task 7).

Table 2 presents a summary of the type and number of samples collected from each phase of the DEM/VAL. Figure 15 provides a Gantt chart of the technology demonstration schedule. Appendix C contains a summary of the operation of the groundwater extraction period. Table 3 presents a detailed summary of the O&M and sampling events. The following sections provide a brief summary of each operational phase of the DEM/VAL.

5.5.1 Task 1 – Well Installation and System Shake Down

A total of 30 wells (two central extraction wells, ten paired recharge wells and three multilevel bundle monitoring wells with six depth intervals each) were installed between 17 and 25 January 2011, as described in Appendix B, to complement the existing monitoring wells (four within the demonstration area and six located peripherally). The new wells were developed to remove fine sediments and ensure adequate hydraulic connection with the formation. Initial baseline groundwater samples were collected between 1 and 3 February 2011. Characterization of the well hydraulics was performed at select locations on 15 February 2011 using a pneumatic slug test technique. The system conveyance piping and infrastructure, including the trailer, solar system and extraction pumps, was then installed, connected and tested for leaks. The infrastructure for the PED DEM/VAL included a solar powered groundwater recirculation system mounted within a mobile trailer.

5.5.2 Task 2 – Baseline Soil and Groundwater Sampling

Baseline soil VOC concentrations were measured on soil samples collected on 19 January 2011 during installation of the extraction and multilevel bundle monitoring wells. Initial baseline groundwater samples were collected on 1 to 3 February 2011 from each of the newly installed wells and existing monitoring wells within the test area, and analyzed for VOCs to confirm the distribution of VOCs within the demonstration area. Details for this sampling event are provided in Appendix B and the results are provided in Appendix E and Section 5.7 below.

5.5.3 Task 3 – Baseline Flux Assessment

The groundwater extraction and recharge system was operated, without addition of PED, for a period of about 4 weeks to establish the baseline condition. Groundwater recirculation was initiated on 14 March 2011 and operated until 18 April 2011. During this time, samples were collected weekly from each central extraction well and up to six monitoring wells and analyzed for a variety of parameters as detailed above (refer to Table 3 and the sampling tables in Appendix D).

TABLE 2. TOTAL NUMBER AND TYPES OF SAMPLES COLLECTED
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

STAGE	MATRIX	NUMBER OF SAMPLES	ANALYTE	SAMPLING FREQUENCY / LOCATION ⁽¹⁾
Stage 2 - Baseline and Stage 3 - Baseline Flux Assessment	Soil: Laboratory Measurement	19	VOCs (includes nBA)	4 locations within test plot, 4 to 6 depths per location
		8	Fraction of Organic Carbon	2 locations within test plot, 4 depths per location
		4	Grain Size Distribution	4 samples from location SB1002
	Groundwater: Field Measurement	na	Field Parameters (DO, ORP, pH, conductivity, temperature)	Data was recorded during all sample collection events
	Water: Laboratory Measurement	6	VOCs (includes nBA and n-butanol)	Effluent samples from GAC treatment
	Groundwater: Laboratory Measurement	94	VOCs (includes nBA and n-butanol)	Initial baseline from all wells including 6 perimeter wells and 4 injection wells; weekly from 2 RWs and 8 MWs for 3 weeks of recirculation; snapshot of all
		30	Volatile Fatty Acids	Weekly from 2 RWs for 3 weeks during recirculation; snapshot of all locations except perimeter wells at end of one month of recirculation
		30	Tracers (bromide & iodide)	Weekly from 2 RWs for 3 weeks during recirculation; snapshot of all locations except perimeter wells at end of one month of recirculation
		36	Total Organic Carbon	Weekly from 2 RWs for 3 weeks during recirculation; snapshot of all locations, including perimeter wells, at end of one month of recirculation
		26	Dissolved Hydrocarbon Gases	Biweekly samples from 2 RWs during recirculation (i.e. after about 2 weeks), and snapshot of all locations except perimeter wells at end of one month of recirculation
		15	Hydrogen Sulfide	Biweekly samples from 2 RWs during recirculation (i.e. after about 2 weeks), and snapshot of 2 RWs and 11 MWs at end of one month of recirculation
		15	Anions	Biweekly samples from 2 RWs during recirculation (i.e. after about 2 weeks), and snapshot of 2 RWs and 11 MWs at end of one month of recirculation
		15	Alkalinity	Biweekly samples from 2 RWs during recirculation (i.e. after about 2 weeks), and snapshot of 2 RWs and 11 MWs at end of one month of recirculation
		12	Dissolved Metals	Sampling at the end of one month of recirculation from 2 RWs and 11 MWs
6	Microbial Characterization (<i>Dhc</i> 16S rRNA gene/ <i>vcrA</i>)	Sampling at the end of one month of recirculation from 2 RWs and 4 MWs		
Stage 4 PED Injection	Groundwater: Field Measurement	na	Field Parameters (DO, ORP, pH, conductivity, temperature)	Data was recorded during all sample collection events
	Water	17	VOCs (includes nBA and n-butanol)	Samples from selected batches of PED injection fluid
		17	Tracers (bromide & iodide)	Samples from selected batches of PED injection fluid
	Groundwater: Laboratory Measurement	29	VOCs (includes nBA and n-butanol)	Following PED injection, DP sample collection at 4 step-out locations, with 4 to 5 depths each; sampling at 11 select MWs
25		Tracers (bromide & iodide)	Following PED injection, DP sample collection at 4 step-out locations, with 4 to 5 depths each; sampling at 11 select MWs	
Stage 5 Biomass Growth	Soil: Laboratory Measurement	17	VOCs (includes nBA and n-butanol)	3 locations from test plot, 5 to 6 depths per location
	Groundwater: Field Measurement	na	Field Parameters (DO, ORP, pH, conductivity, temperature)	Data was recorded during all sample collection events
	Groundwater: Laboratory Measurement	24	VOCs (includes nBA and n-butanol)	Snapshot following shut-in period, all locations except perimeter wells
		24	Volatile Fatty Acids	Snapshot following shut-in period, all locations except perimeter wells
		24	Tracers (bromide & iodide)	Snapshot following shut-in period, all locations except perimeter wells
		24	Total Organic Carbon	Snapshot following shut-in period, all locations except perimeter wells
		24	Dissolved Hydrocarbon Gases	Snapshot following shut-in period, all locations except perimeter wells
		13	Hydrogen Sulfide	Snapshot following shut-in period, subset of locations (2 RWs, 11 MWs)
		13	Anions	Snapshot following shut-in period, subset of locations (2 RWs, 11 MWs)
		13	Alkalinity	Snapshot following shut-in period, subset of locations (2 RWs, 11 MWs)
12	Dissolved Metals	Snapshot following shut-in period, subset of locations (2 RWs, 10 MWs)		

TABLE 2. TOTAL NUMBER AND TYPES OF SAMPLES COLLECTED
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

STAGE	MATRIX	NUMBER OF SAMPLES	ANALYTE	SAMPLING FREQUENCY / LOCATION ⁽¹⁾	
Stage 6 Recirculation System Operation	Soil: Laboratory Measurement	22	VOCs (includes nBA and n-butanol)	3 locations within test plot, 7 to 8 depths per location	
	Groundwater: Field Measurement	na	Field Parameters (DO, ORP, pH, conductivity, temperature)	Data was recorded during all sample collection events	
	Groundwater: Laboratory Measurement		84	VOCs (includes nBA and n-butanol)	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 of all locations; snapshot at month 6 of all locations
			72	Volatile Fatty Acids	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 of all locations except perimeter wells
			72	Tracers (bromide & iodide)	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 of all locations except perimeter wells
			78	Total Organic Carbon	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 of all locations except perimeter wells; snapshot at month 6 of all locations
			72	Dissolved Hydrocarbon Gases	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 of all locations except perimeter wells
			50	Hydrogen Sulfide	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 from subset of locations (2 RWs, 11 MWs)
			50	Anions	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 from subset of locations (2 RWs, 11 MWs)
			50	Alkalinity	2 RWs weekly for one month, biweekly for five months; snapshot at month 3 and month 6 from subset of locations (2 RWs, 11 MWs)
			48	Dissolved Metals	2 RWs weekly for one month, biweekly for five months; snapshot at month 6 from subset of locations (2 RWs, 10 MWs)
			12	Microbial Characterization (<i>Dhc</i> 16S rRNA gene/ <i>vcrA</i>)	Snapshot at month 3 and month 6, from 2 RWs and 4 MWs
Stage 7 Interim Measure Recirculation System Operation	Soil: Laboratory Measurement	22	VOCs (includes nBA and n-butanol)	3 locations within test plot, 7 to 8 depths per location	
	Groundwater: Field Measurement	na	Field Parameters (DO, ORP, pH, conductivity, temperature)	Data was recorded during all sample collection events	
	Groundwater: Laboratory Measurement		64	VOCs (includes nBA and n-butanol)	2 RWs monthly for five months; snapshot at month 10 of all locations; snapshot at month 13 of all locations except perimeter wells
			48	Total Organic Carbon	Snapshot at month 10 and month 13 at all locations except perimeter wells
			48	Dissolved Hydrocarbon Gases	Snapshot at month 10 and month 13 at all locations except perimeter wells
			12	Microbial Characterization (<i>Dhc</i> 16S rRNA gene/ <i>vcrA</i>)	Snapshot at month 10 and month 13, from 2 RWs and 4 MWs

Notes:

(1) There are 23 sampling locations (wells) within the treatment zone, including 2 RWs, 3 existing MWs, 3 nested multilevel MWs with 6 screen depth intervals each. There is 1 existing MW screened below the treatment zone. There are 3 far-field locations on the perimeter, each with a pair of wells screened above and below the clay horizon. Of the 10 injection wells, 4 were sampled at baseline. In addition, several DP locations were used for soil and groundwater sampling.

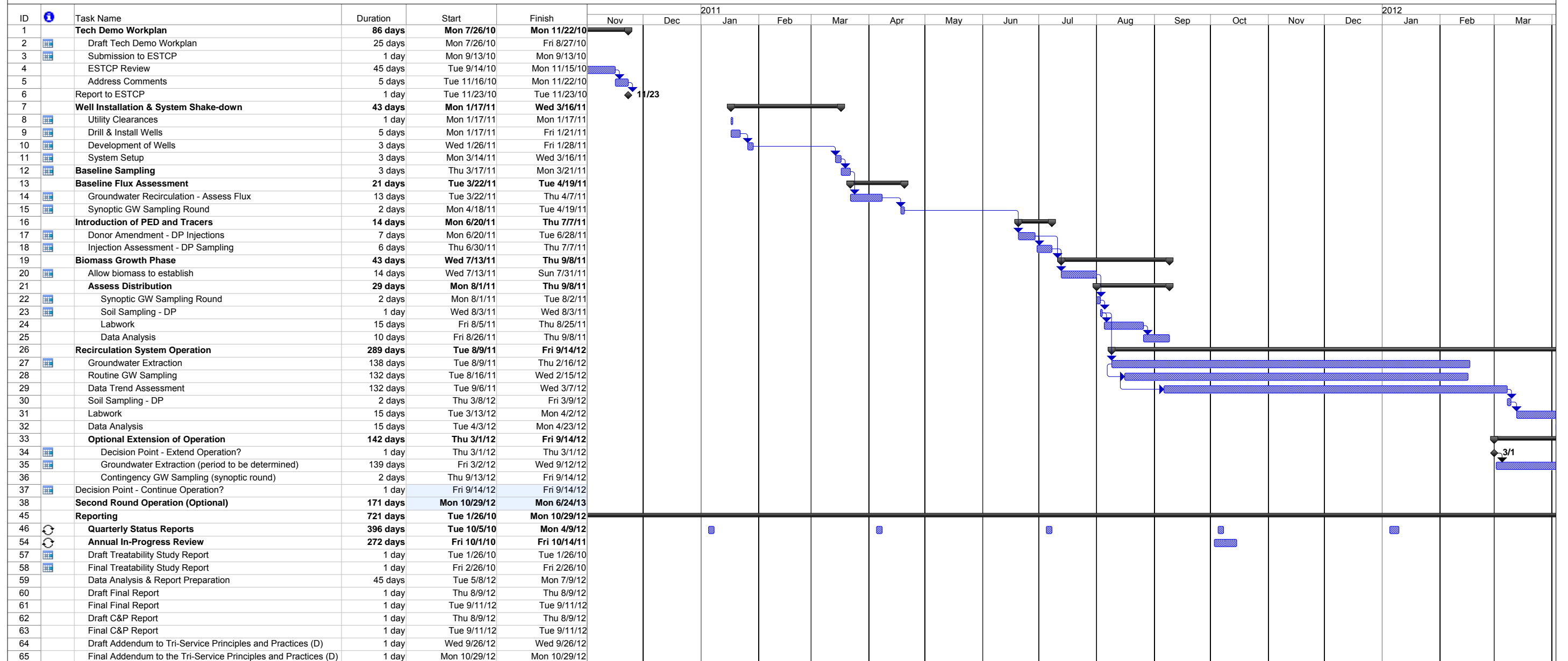
<i>Dhc</i> - <i>Dehalococcoides</i>	nBA - n-butyl acetate
DO - Dissolved oxygen	ORP - oxidation reduction potential
DP - direct push	RW - extraction well
MW - monitoring well	<i>vcrA</i> - vinyl chloride reductase enzyme
na - not applicable	VOC - volatile organic compound

TABLE 3. PED DEM/VAL EVENT SCHEDULE SUMMARY

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Task Name	Date	Activity
Well Installation	17 to 21 and 24 & 25 January 2011	Well Installations & Baseline Soil Sampling
Baseline Sampling	1 to 3 February 2011	Baseline groundwater sampling
Baseline Sampling	15-Feb-11	Baseline hydraulic conductivity assessments
System Install & Shake Down	March 2011	Groundwater recirculation system constructed, including mobile trailer
	14-Mar-11	Groundwater recirculation system start up
Baseline Flux Assessment	22-Mar-11	BFA Week 1 Groundwater Sampling
	28-Mar-11	BFA Week 2 Groundwater Sampling
	7-Apr-11	BFA Week 3 Groundwater Sampling
	18 and 19 April	BFA Week 4 Groundwater Sampling Synoptic Survey
	18-Apr-11	Recirculation system shut down
Introduction of PED & Tracers	20 to 24 and 27 & 28 June 2011	PED Injection Activities
	30-Jun-11	DPT groundwater sampling (DPT328 – DPT331) to aid in evaluation of radius of influence from injection activities
	7-Jul-11	Groundwater sampling from select site monitoring wells; to evaluate nBA distribution
Biomass Growth Phase	July to August 2011	Biomass growth phase – recirculation system off
	1 to 3 August 2011	Post-biomass growth phase soil and groundwater sampling
Recirculation System Operation	9-Aug-11	Restart groundwater recirculation system
	12-Aug-11	Week 1 O&M and groundwater sampling (RW wells only)
	18-Aug-11	Week 2 O&M and groundwater sampling (RW wells only)
	24-Aug-11	Week 3 O&M and groundwater sampling (RW wells only)
	31-Aug-11	Week 4 O&M and groundwater sampling (RW wells only)
	8-Sep-11	Week 5 O&M
	15-Sep-11	Week 6 O&M and groundwater sampling (RW wells only)
	22-Sep-11	Week 7 O&M
	28-Sep-11	Week 8 O&M and groundwater sampling (RW wells only)
	5-Oct-11	Week 9 O&M
	13-Oct-11	Week 10 O&M and groundwater sampling (RW wells only)
	20-Oct-11	Week 11 O&M
	25- to 27-Oct-11	Week 12 (Month 3) O&M and groundwater sampling (synoptic survey)
	3-Nov-11	Week 13 O&M
	10-Nov-11	Week 14 O&M and groundwater sampling (RW wells only)
	17-Nov-11	Week 15 O&M
	22-Nov-11	Week 16 O&M and groundwater sampling (RW wells only)
	1-Dec-11	Week 17 O&M
	7-Dec-11	Week 18 O&M
	15-Dec-11	Week 19 O&M and groundwater sampling (RW wells only)
	22-Dec-11	Week 20 O&M
	5-Jan-12	Week 22 O&M and groundwater sampling (RW wells only)
	16-Jan-12	Week 24 O&M
	26-Jan-12	Week 25 O&M and groundwater sampling (RW wells only)
	6-Feb-12	Week 27 O&M
	13-Feb-12	Week 28 (Month 7) Final Soil Samples
	14- to 16-Feb-12	Week 28 (Month 7) O&M and Final Dem/Val Groundwater Sampling (synoptic survey)
Post PED Monitoring (IMWP)	2-Mar-12	Week 30 O&M
	15-Mar-12	Week 32 O&M and groundwater sampling (RW wells only)
	5-Apr-12	Week 35 O&M
	19-Apr-12	Week 37 O&M and groundwater sampling (RW wells only)
	4-May-12	Week 39 O&M
	17-May-12	Week 41 O&M and groundwater sampling (RW wells only)
	7-Jun-12	Week 44 O&M
	21-Jun-12	Week 46 O&M
	26- to 27-Jun-12	Week 47 (Month 10) groundwater sampling (synoptic survey)
	10-Jul-12	Week 49 O&M
	19-Jul-12	Week 50 O&M and groundwater sampling (RW wells only)
	2-Aug-12	Week 52 O&M
	16-Aug-12	Week 54 O&M and groundwater sampling (RW wells only)
	6-Sep-12	Week 57 O&M
	10-Sep-12	Week 58 soil sampling
	13-Sep-12	Week 58 (Month 13) groundwater sampling (synoptic survey)
		** no final readings, not sure when system off

FIGURE 15
FIELD SCHEDULE
 Hot Spot 1, LC34, Cape Canaveral, FL
 ESTCP Project ER-0716



Project: PED ER-0716
 Date: Fri 3/8/13

Task		Summary		External Milestone		Inactive Summary		Manual Summary Rollup		Finish-only	
Split		Project Summary		Inactive Task		Manual Task		Manual Summary		Progress	
Milestone		External Tasks		Inactive Milestone		Duration-only		Start-only		Deadline	

At the end of this period of recirculation, on 18 and 19 April 2011, a comprehensive synoptic groundwater sampling event was conducted in which all monitoring locations were sampled to determine the baseline distribution of TCE and other parameters (refer to Table 3 and the sampling tables in Appendix D). The results from this synoptic is sampling for the baseline flux measurement phase served as the baseline event for post injection data analysis.

During this initial groundwater recirculation phase, extracted groundwater was treated with GAC to remove VOCs prior to re-injection.

5.5.4 Task 4 – Introduction of PED and Tracers

PED injection was performed from 20 to 28 June 2011 using an injection platform and DPT injection tools. Appendix C contains supplemental information on the PED and tracer injections. Fluid containing PED and tracers was amended throughout the demonstration area via a set of 20 DPT injection locations. A total of 34,000 gal (1,700 gal per injection point) of fluid containing 3,000 mg/L of nBA was injected, in a series of 2-ft intervals, into the target depth interval from 23 to 62 ft BLS.

Potassium bromide (KBr) was added to all injectate batches at a target bromide concentration of approximately 60 mg/L in the injection fluid. Relative bromide concentrations can be used to normalize PED concentrations to account for dilution. PED injection fluids for the upper zone were also amended with potassium iodide (KI) at a target iodide concentration of 140 mg/L in the injection fluid. This concentration was selected to be somewhat higher than for bromide, since it was expected that only relatively small amounts of fluid, if any, would be transported through the clay layer from the upper sweep zone to the lower sweep zone.

5.5.5 Task 5 – Biomass Growth Phase

Following PED injection, the recirculation system remained off for a period of six weeks to allow the PED to partition into NAPL within the demonstration area and to facilitate the acclimation and establishment of biomass within the demonstration area. Groundwater extraction during this ‘shut-in’ phase was undesirable, since it might have removed much of the amended nBA and re-injected it on the periphery. At the end of the Biomass Growth Phase, the distribution of PED and VOCs within the demonstration area was assessed through DPT soil sampling and a synoptic survey of groundwater concentrations. This would help to assess the partitioning effect of PED into residual DNAPL and establish a baseline before recirculation was restarted.

5.5.6 Task 6 – Recirculation System Operation

The groundwater recirculation system was activated on 09 August 2011 and operated for approximately thirteen months, until 13 September 2012. The first six months, through 16 February 2012, are considered the Main Recirculation Phase, which corresponds to the

duration of the DEM/VAL proposed in the TDP. System operation was continued for an additional seven months, through 13 September 2012, under an Interim Measure Work Plan (IMWP) for NASA. This continuation period is referred to as the Interim Measure Recirculation Phase (refer to Appendix C).

5.5.7 Task 7 - System Demobilization

The system was left to NASA at the end of the Main Recirculation Phase, to conduct the Interim Measure Recirculation Phase. At the end, the system was idled. NASA may decide to perform further remediation at Hot Spot 1 in the future partly utilizing some of the infrastructure in place.

5.5.8 Waste Disposal

Because the DEM/VAL system involved groundwater recirculation, only minimal waste was produced. All soils and liquids generated during drilling/coring, well purging and equipment cleaning were containerized by the drilling or sampling personnel in approved Department of Transportation (DoT) drums and placed on spill pallets provided by NASA. Investigation derived waste (IDW) characterization results were provided to NASA to facilitate proper disposal in accordance with applicable regulations and NASA standard site protocols.

5.6 SAMPLING METHODS

The sampling plan was designed to collect sufficient data to validate the performance of the PED technology under actual site conditions and allow potential end users to evaluate the technology. Table 2 summarizes the number and frequency of sample collection, types of samples, and analytes of interest. Table D-1 Appendix D provides details of the various groundwater sampling events. Table 4 presents the laboratory analytical methods used for the selected sample analyses. The soil and groundwater samples collected were analyzed for organic and inorganic parameters by methods specified in the USEPA's SW846 Methods, American Standard for Testing and Materials (ASTM) test methods, or laboratory-specific methods.

Sampling activities for the DEM/VAL, including field measurements, sample collection, decontamination, and documentation were performed in accordance with FDEP Standard Operating Procedures (SOPs) for Field Activities (DEP-SOP-001/01) dated March 31, 2008 (effective December 3, 2008) (FDEP, 2008) and the NASA Sampling and Analysis Plan (NASA, 2006). Appendix F contains a summary of the quality control and quality assurance metrics for the DEM/VAL.

TABLE 4. ANALYTICAL METHODS FOR SAMPLE ANALYSIS

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Matrix	Analyte	Method ¹	Sample Container	Preservative	Holding Time
Soil	VOCs (includes nBA and n-butanol)	5035/8260C	4 oz. soil jars	Cool to 4°C +/- 2°C	14 days
	Fraction of Organic Carbon	Combustion ²	4 oz. soil jars	Cool to 4°C +/- 2°C	28 days
	Total Organic Carbon	EPA LKahn 7-27-1988	4 oz. soil jars	Cool to 4°C +/- 2°C	28 days
	Grain Size Distribution	ASTM D 422 with hydrometer	Sealable plastic	None	None
	Microbial Characterization	Gene-Trac-Dhc (Method 1) ³ Gene-Trac-VC (Method 2) ³	50 mL screw cap tube	Cool to 4°C +/- 2°C	10 days
Groundwater	Field Parameters (DO, ORP, pH, conductivity, temperature)	Field	NA	NA	NA
	VOCs (includes nBA and n-butanol)	8260C	3 x 40 mL VOA	cool to 4°C +/- 2°C	7 days
	Dissolved Hydrocarbon Gases	RSK175	2 x 40 mL VOA	Cool to 4°C +/- 2°C, preserved with HCl	14 days
	Volatile Fatty Acids	HPLC	250 mL HDPE	Cool to 4°C +/- 2°C	28 days
	Anions (chloride, nitrate, nitrite, sulfate)	300.0/353.2	125 mL HDPE	Cool to 4°C +/- 2°C	28 days (Nitrate/Nitrite 48 hours)
	Tracers (Bromide and Iodide)	300.0	125 mL HDPE	Cool to 4°C +/- 2°C	28 days
	Alkalinity	2320B	250 mL HDPE	No headspace, cool to 4°C +/- 2°C	14 days
	Dissolved Metals (arsenic, iron, manganese)	6010C	500 mL HPDE	field filtered prior to acid preservation with HNO ₃ to pH <2, cool to 4°C +/- 2°C	6 months
	Sulfide	SM 4500-S2- F	500 mL HPDE	Zinc Acetate and NaOH	7 days
	Total Organic Carbon	9060/9060A	250 mL plastic bottle	field filtered prior to acid preservation or filtered in lab within 48 hours of collection prior to acid preservation with H ₂ SO ₄ to pH <2, cool to 4°C +/- 2°C	28 days
	Microbial Characterization	Gene-Trac-Dhc (Method 1) ³ Gene-Trac-VC (Method 2) ³	1 L HDPE	Cool to 4°C +/- 2°C	10 days

Notes:

1 - United States Environmental Protection Agency Method Number

2 - University laboratory method. Combustion in quartz tube furnace with infrared detection of carbon dioxide produced.

3 - SiREM Method (non-EPA). Genetic probe method using quantitative polymerase chain reaction (qPCR) analysis of the 16S rRNA gene (i.e., Gene-Trac-Dhc analysis) or the qPCR method used to quantify the Dehalococcoides vinyl chloride reductase (vcrA) gene (i.e., Gene-Trac-VC analysis).

°C - degrees Celsius
Dhc - *Dehalococcoides*
 DO - dissolved oxygen
 H₂SO₄ - sulfuric acid
 HCl - hydrochloric acid

HDPE - high density polyethylene
 HNO₃ - nitric acid
 L - liter
 mL - milliliter
 NA - not applicable

ORP - oxidation reduction potential
 PED - Partitioning electron donor
 SiREM - SiREM Laboratories, Guelph, Ontario
 VOA - volatile organic analysis
 VOC - volatile organic compounds

5.7 SAMPLING RESULTS AND ANALYSIS

This section presents the results obtained during the demonstration. Several Appendices contain supporting information specifically related to the results of the PED DEM/VAL, as follows:

- Appendix B – System Installation and Baseline Characterization
- Appendix C – Operations Summary
- Appendix D – Sampling Program Tables
- Appendix E – Data Summary
- Appendix F – Quality Assurance / Quality Control (QA/QC)
- Appendix G – Laboratory Analytical Reports

The results obtained from the PED evaluation are summarized in the subsections below.

5.7.1 Evaluation of Data Quality Indicators

During the DEM/VAL, data quality was assessed through evaluation of the data quality indicators (DQIs) precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). Appendix F contains a summary of the QA/QC completed on the data. Evaluation of the PARCCS data quality indicators was completed to ensure that data quality objectives were met. Field QA/QC data did not indicate any major data quality issues. No analytes were detected in any of the trip blanks, field blanks, or equipment blanks, indicating there was no cross-contamination or introduction of contamination during sampling or sample transport. In the majority of instances the relative percent difference (RPD) between field duplicates and parent samples was acceptable.

Laboratory QA/QC data also did not indicate any major data quality issues. For the majority of cases, there were no detections in method blanks, hold times were met, and laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) and matrix spike/ matrix spike duplicate (MS/MSD) recoveries and RPDs were within target ranges. In cases where laboratory QA/QC data were outside of data quality targets, the results are considered usable for the purposes of the study and the reported values represent estimated concentrations.

5.7.2 Baseline Characterization Activities

To characterize the baseline conditions, soil and groundwater samples were collected within the treatment zone. Soil samples were collected during well installation activities. Groundwater sampling included: a) an initial synoptic event (Task 2) to determine the initial VOC distribution within the demonstration area following well construction; b) routine sampling of the extraction wells and selected monitoring locations during recirculation to establish the baseline flux of VOCs (Baseline Flux Assessment Phase, Task 3); and c) a synoptic event to determine the VOC distribution at the end of the Baseline Flux Assessment Phase (Task 3). Appendix B contains a detailed summary of the data collection activities and Appendix E contains a summary of the

resulting data, including tabulated data from the baseline soil and groundwater sampling events. Table 2 summarizes the samples collected and Appendix D presents the groundwater sample collection program.

Operation of the recirculation systems during the Baseline Flux Assessment Phase is summarized in Appendix C. In the upper zone, 58.6 kilo gallons (kgal) were recirculated at an effective average flow rate (i.e. total volume divided by total time) of 1.16 gallons per minute (gpm), representing approximately 2.3 pore volume exchanges of the PED injection zone. In the lower zone, the cumulative volume of groundwater recirculated was 44.0 kgal, representing approximately 1.7 pore volume exchanges of the PED injection zone. The effective average flow rate for the system was 0.87 gpm.

Figure 16 shows the interpolated TCE distribution before PED addition, incorporating prior data and the results of baseline sampling. Figure 17 shows the soil sampling locations for the baseline event and all subsequent soil sampling events.

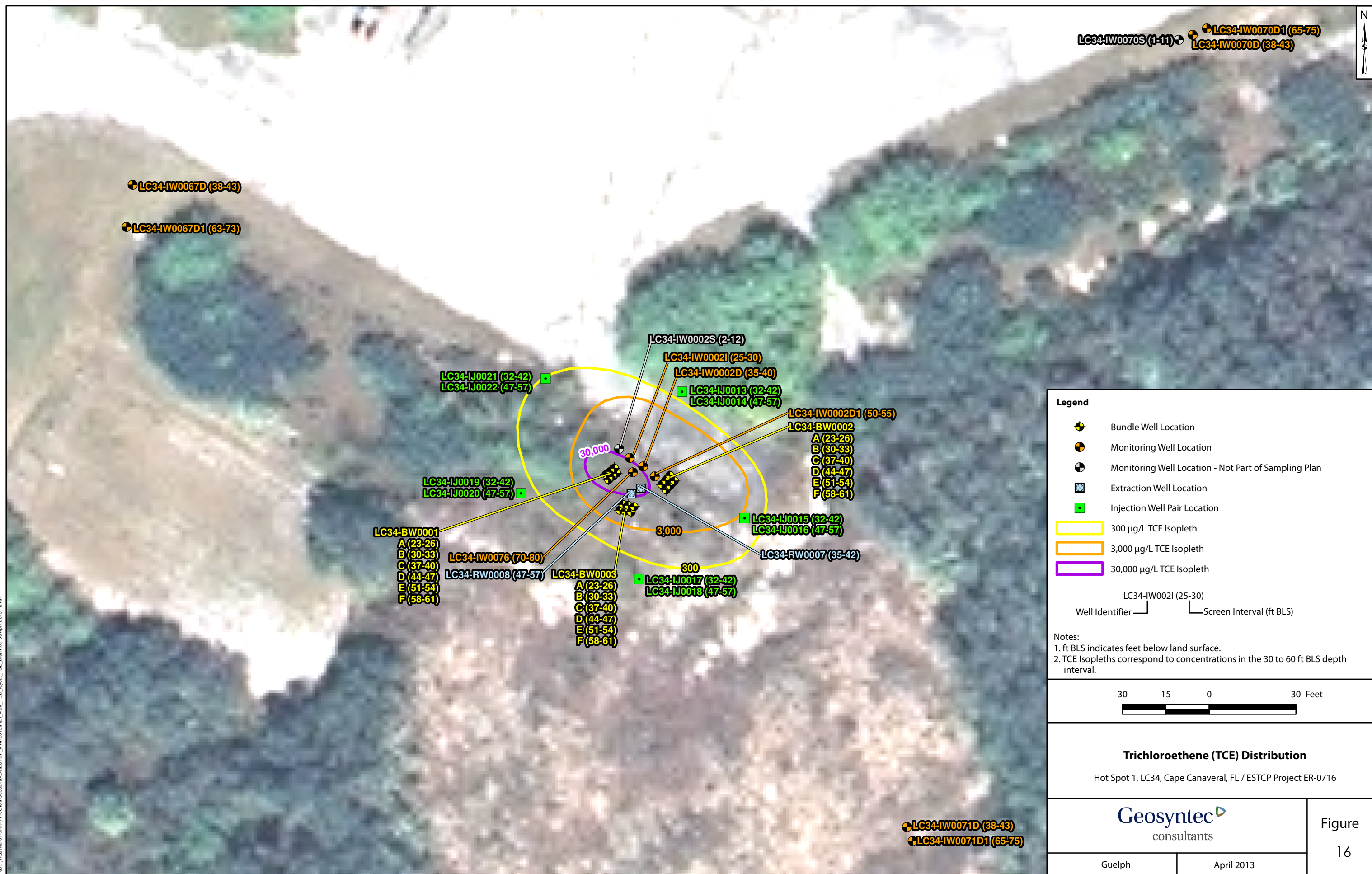
5.7.3 PED and Tracer Amendment

The PED injection was completed as planned. Fluid containing PED and tracers was amended throughout the demonstration area via a set of 20 DPT injection locations. Figure 18 shows the location of the twenty PED injection locations. A total of 34,000 gallons (1,700 gallons per injection point) of fluid containing 3,000 mg/L of nBA was injected into the target depth interval from 23 to 62 ft BLS. Injection rates typically ranged from 6 to 8 gpm, requiring pressures of 30 to 45 pounds per square inch (psi). Details of the PED and tracer injection, including individual records for each injection location, are provided in Appendix C.

A total of 115 gal of nBA, with a total mass of 380 kilograms (kg), was added to the DEM/VAL area. Batch QC samples confirmed that PED and tracers were mixed as intended and that the injection fluid contained the target compounds, with average concentrations of 3,000 mg/L of nBA, 72 mg/L of bromide and 107 mg/L of iodide (when added). The batch QC results are summarized in Table E1.3 in Appendix E.

Based on the target depth intervals, 50% of the total volume, or 17,000 gal of injectate, was amended to the upper sweep zone; 15% of the volume (5,100 gal) was amended within the silty clay horizon; and 35% of the volume (11,900 gal) was amended to the lower sweep zone. A total of roughly 11.6 kg of KBr was introduced to the treatment area, resulting in 3.9 kg of bromide to the upper sweep zone, 1.2 kg within the silty clay horizon and 2.7 kg to the lower sweep zone. A total of about 11.7 kg of KI (8.9 kg of iodide) was added to the 17,000 gal introduced into the upper zone.

Path: (T:\uville-01\DATA) T:\GIS\FC0552\MXD\ESTCP_MAR2013\Plan_View_PED_layout_TCE_Dist.mxd 05 April 2013 MAH



Legend

- Bundle Well Location
- Monitoring Well Location
- Monitoring Well Location - Not Part of Sampling Plan
- Extraction Well Location
- Injection Well Pair Location
- 300 µg/L TCE Isopleth
- 3,000 µg/L TCE Isopleth
- 30,000 µg/L TCE Isopleth

Well Identifier Screen Interval (ft BLS)

Notes:

1. ft BLS indicates feet below land surface.
2. TCE Isopleths correspond to concentrations in the 30 to 60 ft BLS depth interval.

30 15 0 30 Feet

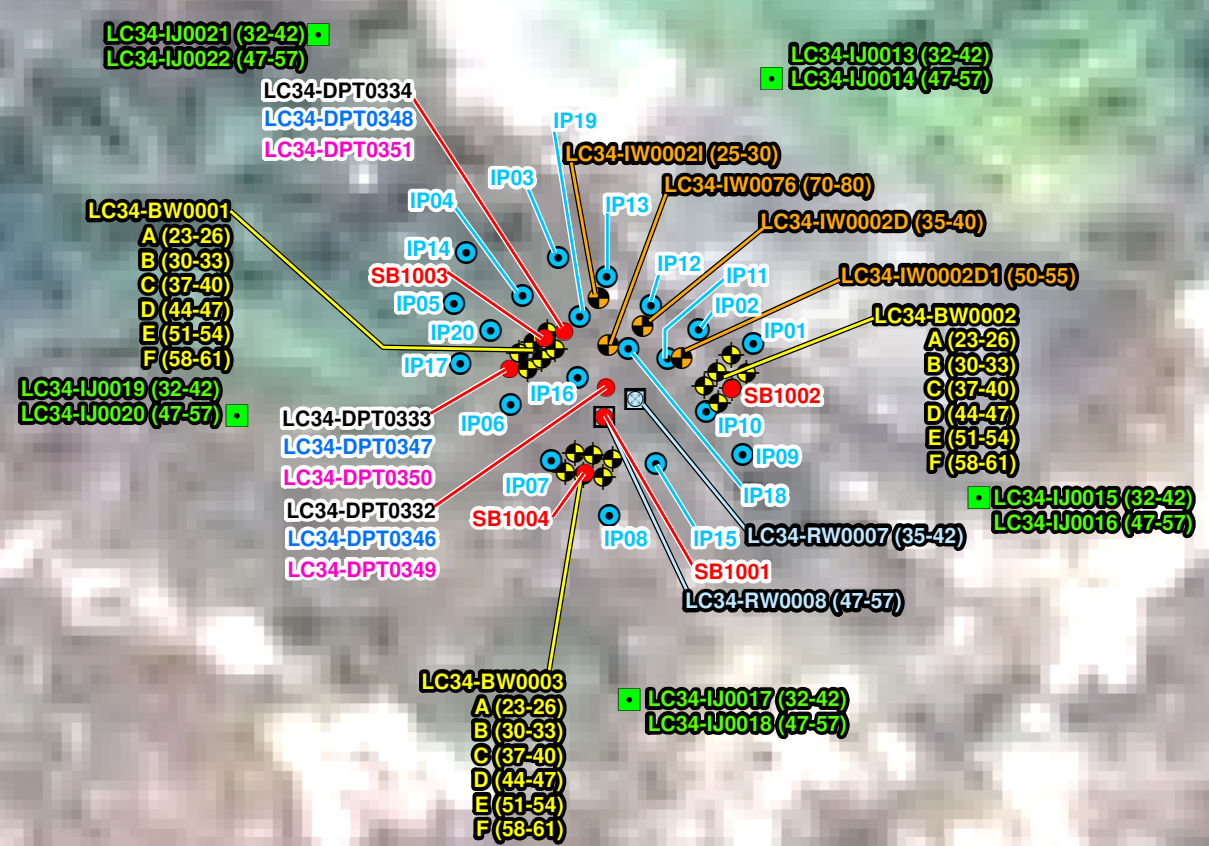
Trichloroethene (TCE) Distribution

Hot Spot 1, LC34, Cape Canaveral, FL / ESTCP Project ER-0716

Geosyntec
consultants

Guelph April 2013

Figure
16

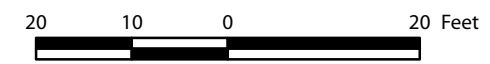


Legend

- DPT Soil Sampling Location (label color indicates event as listed below)
 - **Baseline (January 2011)**
 - **Post Biomass Growth (August 2011)**
 - **End of Main Phase (February 2012)**
 - **End of Interim Measure (September 2012)**
- Bundle Well Location
- Monitoring Well Location
- Extraction Well Location
- Injection Well Pair Location
- PED Injection Point Location

Well Identifier Screen Interval (ft BLS)

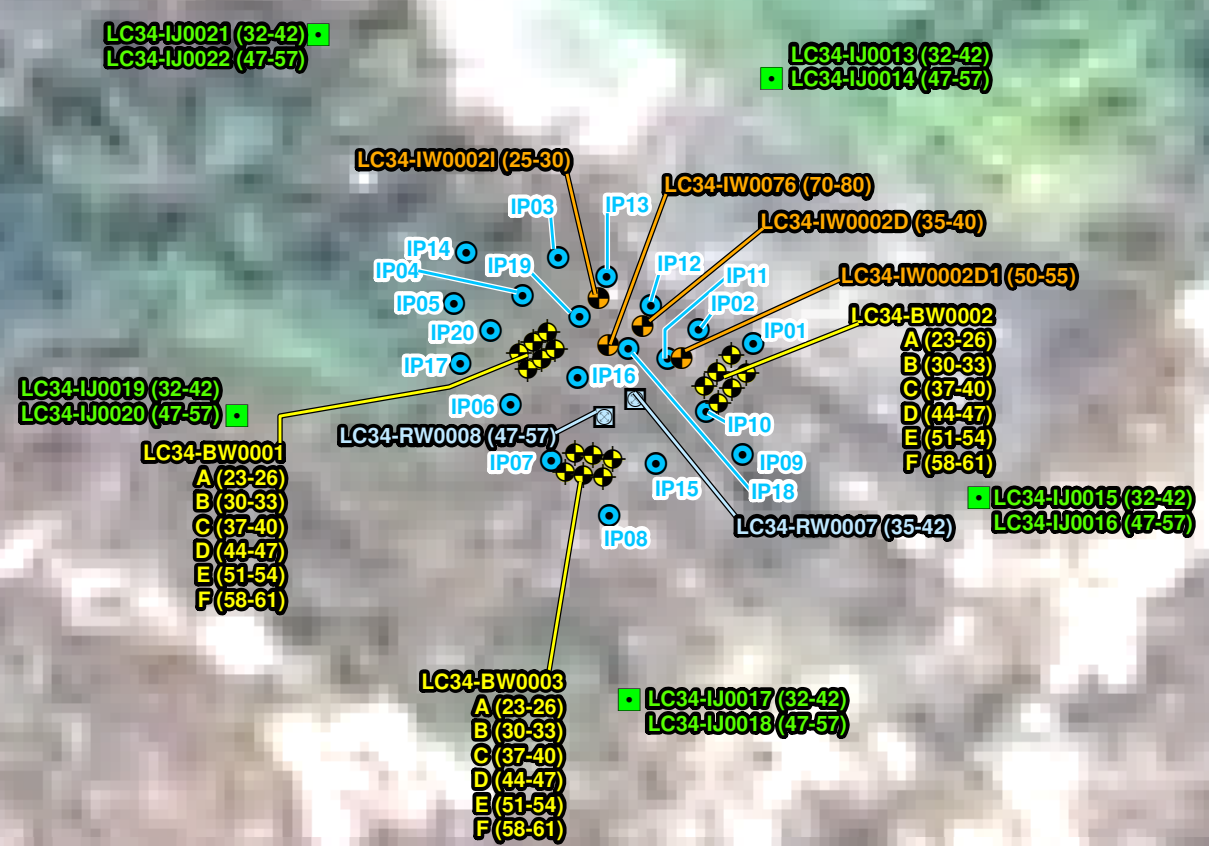
Notes:
 1. ft BLS indicates feet below land surface.
 2. PED indicates Partitioning Electron Donor.



Soil Sampling Locations
 Hot Spot 1, LC34, Cape Canaveral, FL / ESTCP Project ER-0716



Path: (I:\u0000\01\DATA) T:\GIS\ESTCP\052\KOD\ESTCP_MAR2013\PED_sol_locs.mxd 05April2013 MAH

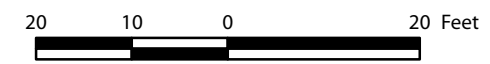


Legend

- Bundle Well Location
- Monitoring Well Location
- Extraction Well Location
- Injection Well Pair Location
- PED Injection Point Location

Well Identifier Screen Interval (ft BLS)

Notes:
 1. ft BLS indicates feet below land surface.
 2. PED indicates Partitioning Electron Donor.



PED Injection Locations
 Hot Spot 1, LC34, Cape Canaveral, FL / ESTCP Project ER-0716



Figure

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Guelph

April 2013

Path: (T:\uville\01\DATA\TUGS\FC0552\XCD\ESTCP_MAR2013\PED_rj_locs.mxd 06 April 2013 MAH

Confirmation samples were collected to evaluate the effectiveness of the PED injections (refer to Appendix C). First, immediately following PED injections, DPT groundwater samples were collected adjacent to select PED injection points to assess the achieved radius of influence (see Appendix C and Table E-1-4 in Appendix E). The nBA concentrations were quite variable, both by location and depth, but this is often the case with direct push injections using conventional electron donor (e.g., with emulsified oils or lactate). The results suggested that the radius of influence was roughly 2 to 2.5 ft, consistent with the design estimates. The ratio of nBA to bromide was quite variable, suggesting that the nBA distribution may not be strongly correlated with the tracer, but the results generally showed that nBA was under-recovered relative to bromide, consistent with nBA partitioning and/or sorbing (see Table E-4-1 in Appendix E). Production of nBuOH was noted at a couple of locations, indicating that some hydrolysis had occurred within the first week (Table E-1-4).

Second, about a week after the PED injections were completed, groundwater samples were collected from a subset of the monitoring wells (see Appendix C for details). The results are presented in Appendix E. There was good distribution of nBA at these locations, with an average concentration of 400 mg/L. Also, at this point significant concentrations of nBuOH had been formed (up to 520 mg/L, with an average concentration of 184 mg/L), representing on average 38% of the PED in these samples. Table E-4-2 in Appendix E presents a comparison of the PED and tracer concentrations in these well samples. The ratio of normalized nBA concentration (considering nBA and nBuOH) to normalized bromide concentration was 0.77 on average. The normalized bromide concentrations suggested that the samples contained an average of 22% injectate, ranging from 3 to 62%. Where available, the iodide results were in agreement. The direct push injection approach that was suitable and distribution was sufficient to continue with the DEM/VAL.

5.7.4 Biomass Growth Phase

If the PED is a successful donor then a standard application would involve injection of the PED and then leaving this in place and treatment would be under ambient (i.e., unpumped) conditions. It was solely for the purposes of the DEM/VAL, to evaluate longevity and quantify effectiveness, that extraction of water was conducted. During this phase the majority of the PED occurred as nBuOH, indicating that the nBA had undergone considerable hydrolysis during this stage. Data indicates consumption of the PED due to microbial activity. The VOC concentrations in this phase indicate that considerable reductive dechlorination. This stage verified that PED injection with the direct push approach was able to provide additional donor and promote dechlorination.

As detailed in Appendix C, the recirculation system remained off for a period of six weeks following PED injection to allow the nBA to partition into NAPL within the demonstration area and to facilitate the acclimation and establishment of biomass within the demonstration plot. At the end of this period, the distribution of PED and VOCs within the demonstration area was assessed through DPT soil sampling and a synoptic survey of groundwater concentrations. These samples established the conditions prior to starting the recirculation system.

The groundwater results from this phase of the DEM/VAL are presented in detail in the various data tables in Appendix E. The nBA and nBuOH concentrations varied considerably throughout the demonstration areas, as did the TOC. The results show that the majority of the PED occurred as nBuOH, indicating that the nBA had undergone considerable hydrolysis during the shut-in period. On average, nBuOH was 84% of the total PED found (i.e. nBA plus nBuOH). The ratio of normalized total nBA concentration to normalized bromide concentration was 0.51 on average. The decrease in this ratio over the period of the shut-in period may reflect some additional partitioning and/or sorption of the PED, but it likely also reflects consumption of the PED due to microbial activity. The VOC concentrations from this event indicate that considerable reductive dechlorination had occurred. Figures 1 and 2 present the time trends for the extraction wells and show the VOC and VFA changes during the biomass growth phase.

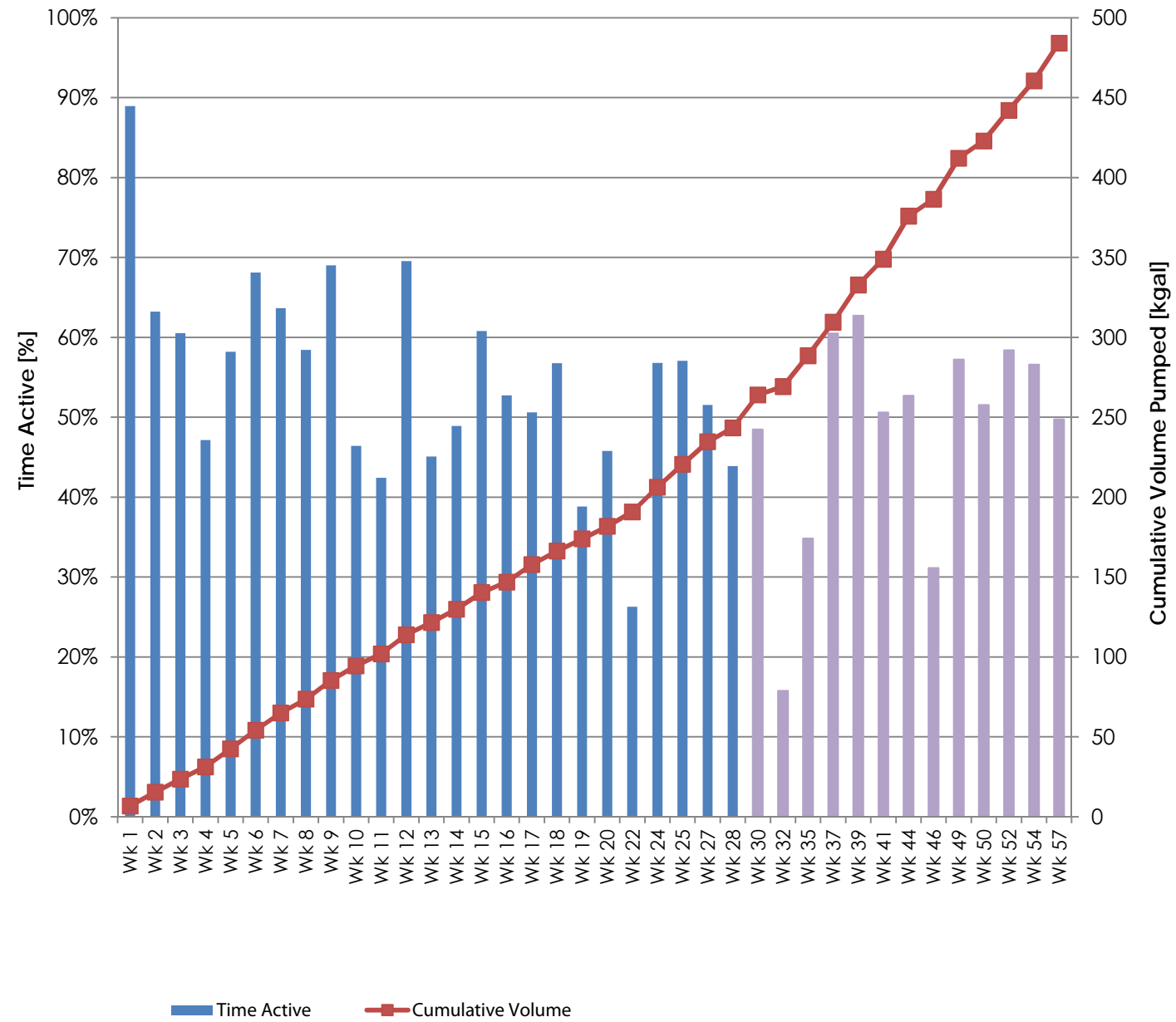
Soil samples were collected at the locations presented on Figure 17 to assess soil VOC concentrations. The VOC concentrations were highly variable with both location and depth, and overall the concentrations were greater than observed at baseline. This is attributable to natural spatial variation. Low concentrations of nBA and nBuOH were detected in some samples, but as there was no evidence in the samples collected of a NAPL phase, no correlation could be attempted.

5.7.5 Main Recirculation Phase

The Main Recirculation Phase occurred between 09 August 2011 and 16 February 2012. The recirculation systems generally operated as designed, although there were periods with no pumping due to limitations in the solar system. Details of the operations are reported in Appendix C, including volumes, flow rates, operating times and routine O&M information. No well rehabilitation was required. Appendix C includes hydrographs from select wells (the extraction wells, a pair of monitoring wells and a pair of injection wells). These clearly show the oscillation in water levels created by the groundwater recirculation system.

In the upper zone, 243.4 kgal were recirculated at an effective average flow rate (i.e. total volume divided by total time) of 0.89 gpm. With flow divided between five injection wells, the average effective injection rates were approximately 0.17 gpm per injection location. Overall, the system was active for about 53% of the time. Figure 19a presents the operating history for RW0007, showing the amount of time the system was active and the cumulative volume pumped over the duration of the DEM/VAL. Variations in the amount of time the system was active are apparent in Figure 19a; weather, and hence recharge of the solar-powered system was the main variable controlling system operation. It is estimated that the recirculated volume represents about 1.4 pore volumes of the sweep zone, or about 9.6 pore volume exchanges of the zone within which PED injection occurred (refer to Appendix C).

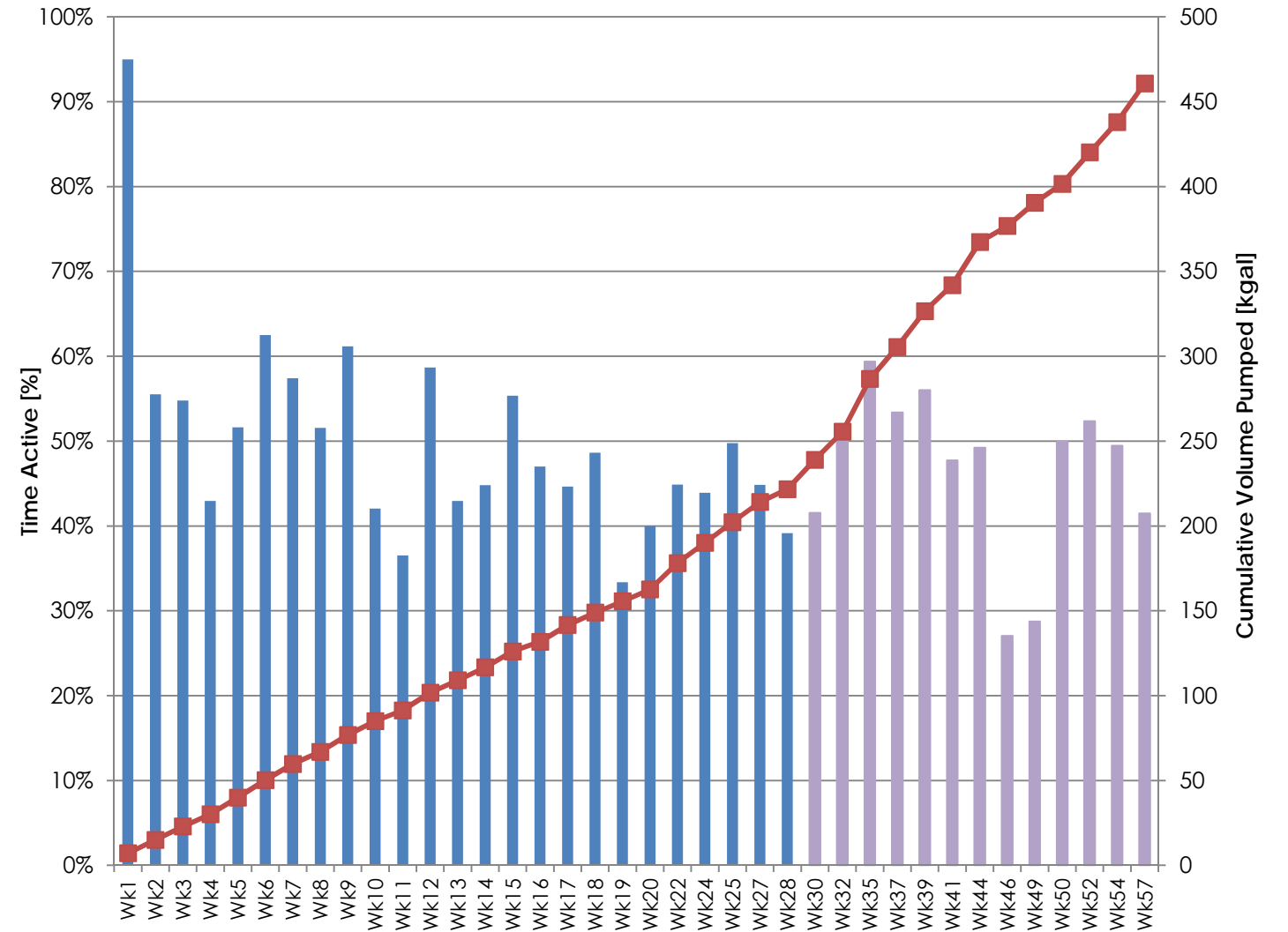
19a) RW0007



Notes:

1. Time Active represents the portion of the day in which the system operated. During this time, the pump cycled 40 minutes on, 20 minutes off.
2. The first 28 weeks (blue bars) represent the Main Recirculation System Operation Phase and subsequent weeks (purple bars) represent the Interim Measure Recirculation System Operation Phase.
3. Readings are not evenly distributed over time; less frequent recordings at later time create appearance of greater pumping rate (slope).

19b) RW0008



Operating History
RW0007 & RW0008
 Launch Complex 34, Cape Canaveral, FL



Figure

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Guelph

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Figure 19b summarizes the operating history for RW0008. A total of 221.6 kgal were recirculated in the lower zone at an effective average extraction flow rate of 0.81 gpm (average effective injection rates of approximately 0.16 gpm per injection location). The system was active for about 48% of the time, slightly less than in the upper zone (9% less). The recirculated volume represents about 1.7 sweep zone pore volumes, or about 8.8 pore volume exchanges of the PED injection zone (refer to Appendix C). These estimates of pore volume exchanges demonstrate that considerably more groundwater was recirculated than was initially amended with PED. This means the PED was sorbed and it stayed in place.

5.7.5.1 Groundwater Sampling - Main Recirculation Phase

Throughout the Main Recirculation Phase, groundwater samples were routinely collected to assess the VOC mass flux and evaluate the microbial reductive dechlorination of VOCs. Groundwater sampling is described in Appendix C and details of the sampling program are provided in Appendix D. The extraction wells were the main focus for routine sampling, with weekly sampling for the first month and then bi-weekly sampling thereafter. Synoptic surveys (snapshots) of the entire DEM/VAL plot, including extraction wells, bundle monitoring wells, existing site monitoring wells and the far-field monitoring wells (30 wells in total) was conducted at Month 3 (October 2011) and at Month 7 (February 2012). The types and numbers of samples are summarized in Table 2. The results are tabulated and presented in graphical form in Appendix E and discussed further below.

5.7.6 **Interim Measure Recirculation Phase**

Following the Main Recirculation Phase, the recirculation system was operated for an additional seven months, from 17 February 2012 through 13 September 2012, under an IMWP for NASA. Details of the operation are presented in Appendix C and summarized in Section 6. Figures 15 and 16 include the operating history for RW0007 and RW0008, respectively, during this Interim Measure Recirculation Phase.

System operation was essentially the same as during the prior phase; the average effective extraction rates at RW0007 and RW0008 were 0.82 gpm and 0.81 gpm, respectively (see Appendix C). Hydrographs for RW0007 and RW0008 for the period of operation are presented in Appendix C. The recirculated volume for the upper sweep zone was 240.9 kgal, representing an additional sweep zone 1.9 pore volumes, or approximately 9.5 additional exchanges of the PED injected area. In the lower sweep zone, the recirculated volume was 239.2 kgal, representing an additional 1.8 pore volumes, or approximately 9.5 additional exchanges of the PED injected area (see Appendix C).

5.7.6.1 Groundwater Sampling – Interim Measure Recirculation Phase

The groundwater sampling program was continued during the Interim Measure Recirculation Phase. Routine monthly samples were collected from the extraction wells, and synoptic surveys

were collected in Month 10 (June 2012) and at the end of operation in Month 13 (September 2012). Groundwater sampling is described in Appendix C and details of the sampling program are provided in Appendix D. The types and numbers of samples are summarized in Table 2. The results are tabulated and presented in graphical form in Appendix E and discussed further in the sections below.

5.7.7 Soil Sampling

Soil sampling activities are described in Appendix C. Soils samples were collected at the end of the Main Recirculation Phase (Month 7) and at the end of the Interim Measure Recirculation Phase (Month 13). The sampling locations, shown in Figure 17, corresponded to the locations sampled following the Biomass Growth Phase, to facilitate comparison over the course of the DEM/VAL. Table 2 presents the number of samples collected and soil VOC results are summarized and presented in Table E-1-1 in Appendix E.

Post PED injection, soil samples collected indicated PED was not present at the sampled locations. The PED, nBA, was only detected in a few locations, at very low concentrations. Minor amounts of nBuOH were observed in a couple of samples.

Similar results were obtained at the end of the Main Recirculation Phase (Month 7), with maximum TCE concentration of 75 mg/kg^{dry} at DPT0348. Again spatial variability appeared to be more significant than changes due to operation of the DEM/VAL. Similar results were obtained at the end of the Interim Measure Recirculation Phase (Month 13), with maximum TCE concentration of 75 mg/kg^{dry} at DPT0350. There was again considerable spatial variability.

Although it is admittedly a crude approach, all of the results for each event were averaged together to develop an average soil concentration (see table below) to estimate TCE and cDCE in soils at the locations sampled. There is some decline in the amount of TCE detected over the course of the DEM/VAL, from the end of the Biomass Growth Phase to the end of the Main Recirculation Phase (Month 7) to the end of the Interim Measure Recirculation Phase (Month 13). Note that baseline is quite different because it represents a different set of locations. However, the analysis is not very robust, given the observed degree of spatial variability.

Average Soil Concentrations (mg/kg)

	TCE	cDCE
Baseline	3.60	2.35
Post Biomass Growth	21.27	2.89
Post Main Recirculation Phase (Month 7)	13.07	5.83
Post Interim Measure Recirculation Phase (Month 13)	10.23	5.70

5.7.8 Groundwater Sampling Results

Groundwater samples collected from the central extraction wells (RW0007 and RW0008) make up the primary data set, which includes field parameters, VOCs, nBA, n-butanol, DHGs, VFAs, alkalinity, anions, dissolved metals, and microbial characterization numbers. Additional data was collected during synoptic events from the entire monitoring well network and used to support the interpretation.

Appendix E presents a summary of all of the analytical data collected for the DEM/VAL, including the extension referred to as the Interim Measure Recirculation Phase conducted for NASA's IMWP.

All of the data collected for the DEM/VAL is tabulated in Appendix E. There are several supporting attachments in Appendix E that contain the tabulated and graphed data collected during the DEM/VAL. A summary of key tables and figures is provided below.

Attachment E-1 contains summary tables for key groundwater parameters collected, including:

- Summary of PED Injectate Batch QC Sampling Results to verify the PED injected to the demonstration area (Table E-1-3)
- Summary of PED Injection Confirmation Grab Groundwater Sampling Results (Table E-1-4)
- Groundwater Sampling Results: Volatile Organic Compounds (Table E-1-5)
- Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers (Table E-1-6)
- Groundwater Sampling Results: TOC, VFAs and nBA (Table E-1-7)
- Groundwater Sampling Results: Dissolved Metals (Table E-1-8)
- Groundwater Sampling Results: Field Geochemical Parameters (Table E-1-9)
- Groundwater Sampling Results: *Dhc* and Vinyl Chloride Reductase (Table E-1-10)

Attachment E-2 presents time-series plots of selected analytes for each monitoring well location. For each monitoring location there is a set of four time-series plots, as follows:

- A) VOC data using molar concentrations;
- B) electron donor results, including nBA, nBuOH, VFA and TOC concentration data;
- C) bromide and iodide tracer concentrations through the end of the Main Recirculation Phase (these analytes were not part of the sample program in the Interim Measure Recirculation Phase); and
- D) geochemical parameters, including methane, ethane, sulfate and sulfide concentrations.

Attachment E-3 presents the VOC distribution history for each monitoring well location in the form of a stacked bar chart, which shows how the total VOC concentrations varied over time as

well as how the composition varied. These figures show the changes in total VOC concentration that were observed following PED addition.

Attachment E-4 provides a summary of the data analysis for assessing the impact of PED addition based on the conservative tracers amended during PED injection. A comparison of PED and tracer concentrations was conducted to confirm the experimental design was valid and to aid in confirming objective 3.6 (delivery of PED to source area). The tracer data collected and analyzed confirmed that PED was delivered to the source area and that it persisted for over 8 months of groundwater extraction/recirculation.

Attachment E-5 includes data analysis of the extraction wells to support the determination of the qualitative and quantitative objectives on PED effectiveness.

Attachment E-6 contains the supporting tables for the estimation of VOC and TVOC mass in the treatment zone over the operational period.

The following subsections present summaries of the key groundwater parameters.

5.7.8.1 VOC Trends

For the upper zone, VOC data from the central extraction well RW0007 (tabulated in Table E-1-5) is presented as a time-series in Figure 3a, including the Initial Baseline and Baseline Flux Assessment results. Figure 3b presents the time-series VOC data for the lower zone from the central extraction well RW0008. Other parameters (electron donors, tracers, and geochemical parameters) measured at the extraction wells are plotted in Appendix E (Attachment E-2). Figure 20 shows the VOC distribution history for RW0007 and RW0008, respectively. Appendix E similarly presents time-series plots (Attachment E-2) and VOC distribution plots (Attachment E-3) for the other monitoring locations.

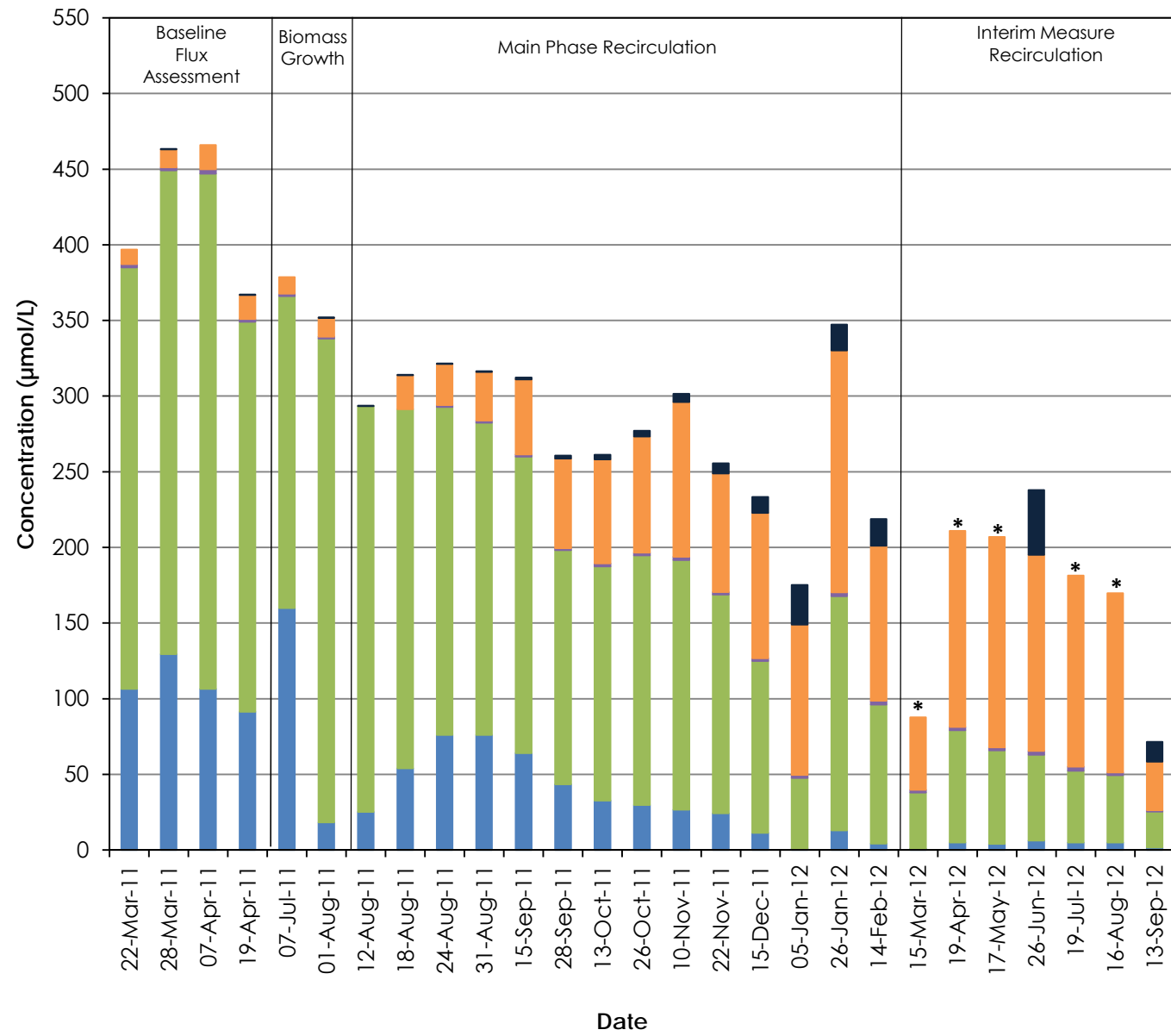
For the upper zone, Figure 20a illustrates that the total VOC flux to RW0007 during the Main Recirculation Phase was less than during the Baseline Flux Assessment Phase, whereas the PED was anticipated to increase the TVOC flux. During Baseline Flux Assessment weekly samples were collected to assess VOC concentrations under pumping conditions. The TVOC concentration and the VOC distribution were stable in the baseline flux phase, with cDCE being the primary VOC. The presence of cDCE is attributed to the larger VOC plume associated with the source area beneath the ESB (refer to Section 4 above). TCE and CFC113 concentrations were also stable (Figure 3a). The concentration of TCE had decreased considerably by the end of the Biomass Growth Phase as a result of PED addition. Over the course of the Main Recirculation Phase, TCE and cDCE concentrations decreased while VC and Ethene concentrations increased, indicating that reductive dechlorination was active. This trend continued through the Interim Measure Recirculation Phase. It is noted that the continued presence of CFC113 may have limited reaction rates in the upper zone.

For the lower zone, Figure 20b illustrates that the total VOC flux to RW0008 during the Main Recirculation Phase was considerably greater than during the Baseline Flux Assessment Phase, indicating that PED addition increased the TVOC flux as anticipated. Note that the concentrations are considerably lower in the lower unit. During Baseline Flux Assessment weekly samples were collected to assess VOC concentrations under pumping conditions. The TVOC concentration and the VOC distribution were stable. TCE was the primary VOC and the cDCE concentration was about half that of TCE. The halo of the ESB plume was not observed in the lower zone at Hot Spot 1. During the Biomass Growth Phase there were strong indications of reductive dechlorination activity. The confirmation samples in July 2011 indicated a significant increase in the TVOC concentration, primarily attributed to cDCE and then the samples at the end of the shut-in period indicated that all of the VOCs at RW0008 had been converted to VC and ethene. Once recirculation was started, groundwater containing TCE and cDCE was drawn to the well. Over the course of the Main Recirculation Phase, TCE concentrations fluctuated somewhat but did not sustain a concentration below baseline until the Interim Measure Recirculation Phase. Concentrations of less-chlorinated products, cDCE, VC and Ethene increased over the operation of the DEM/VAL, indicating that reductive dechlorination was active. This trend continued through the Interim Measure Recirculation Phase.

The extent of reductive dechlorination was characterized by calculating the fraction of chlorine removed from the equivalent concentration of TCE, as described in Appendix E. The quantitative analysis of the extent of dechlorination is illustrated in Figure 4a for RW0007 and Figure 4b for RW0008, respectively. Note that complete conversion to DCE, VC, and ethene would correspond to dechlorination scores of 33%, 67% and 100%, respectively. These figures show that over the course of the DEM/VAL, both the upper and lower zones shifted increasingly toward complete dechlorination.

Figure 21 shows the estimated TVOC mass in the treatment zone based on the observed groundwater concentrations. The total mass of TCE, cDCE and VC is seen to decrease over the period of operation of the DEM/VAL.

20a) RW0007

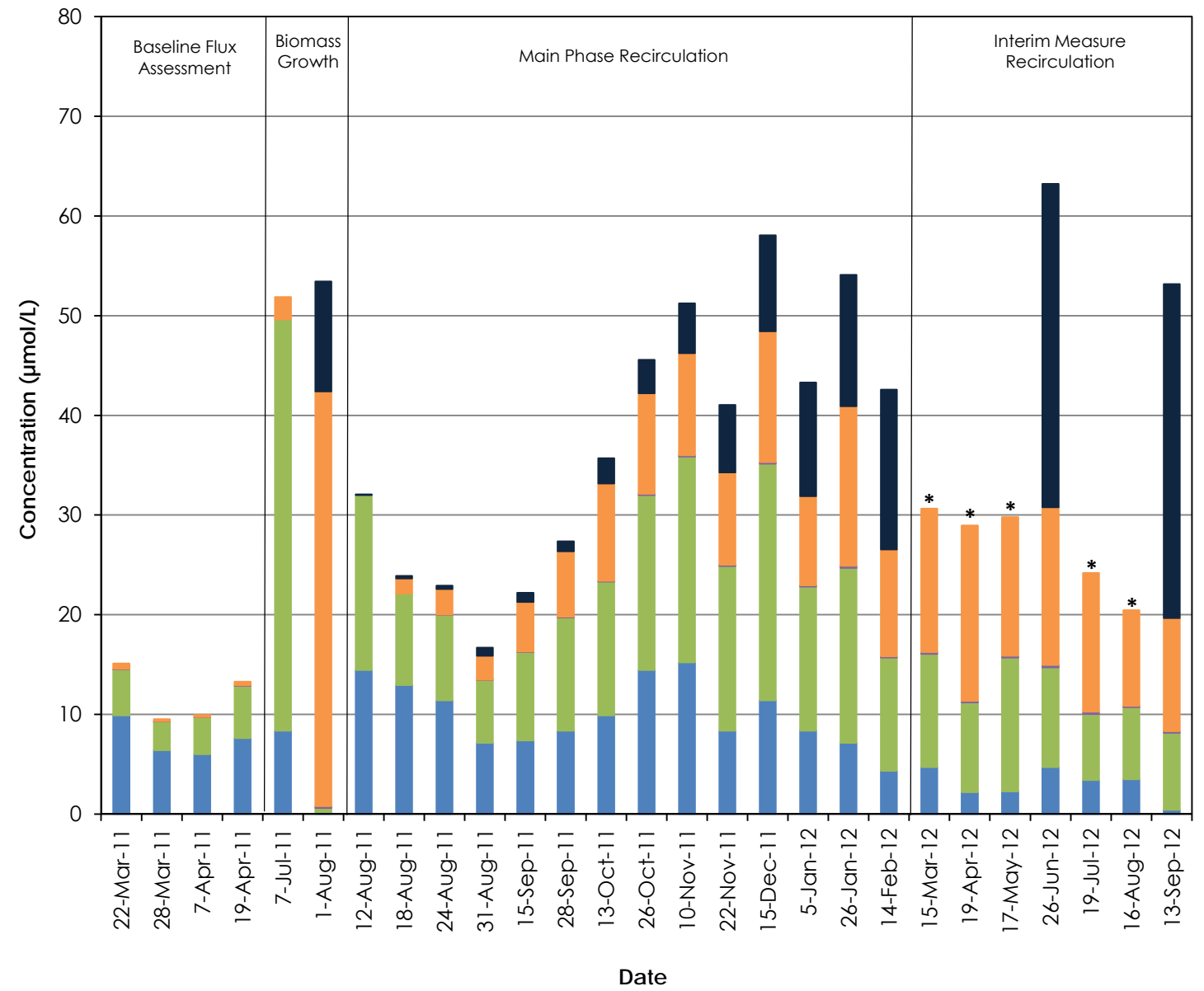


■ TCE ■ cDCE ■ tDCE ■ VC ■ Ethene

Notes:

Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride
 * - no analysis for ethene

20b) RW0008



Volatile Organic Compound Distribution History
 RW0007 & RW0008
 Launch Complex 34, Cape Canaveral, FL

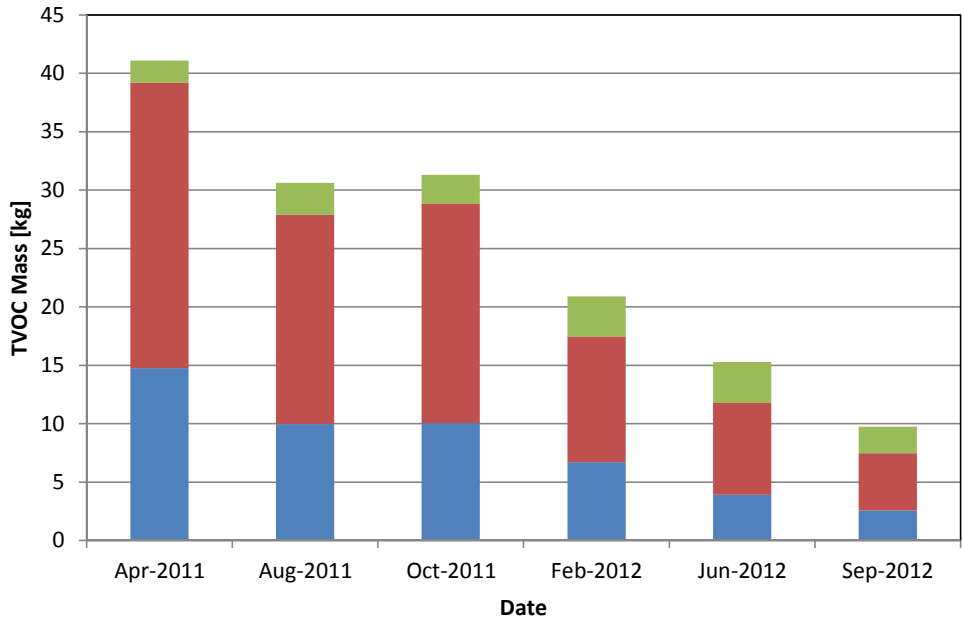


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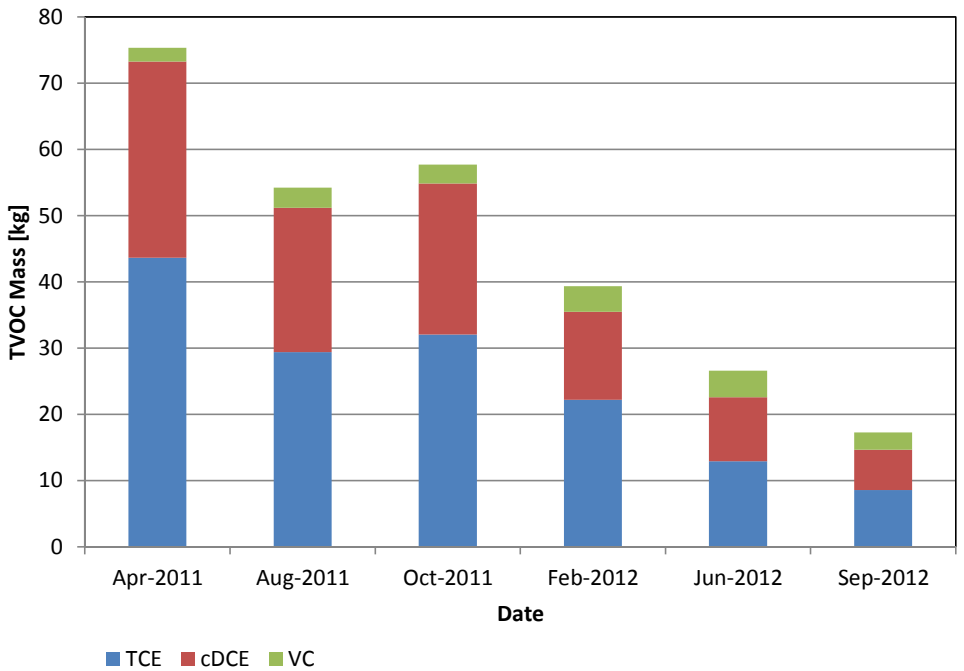
Figure
20

P:\PA\Projects\180272 - ESTCP - PED\04 ESTCP Reporting\21 Final Technical Report\03 FIGURES\Figure 20a&b.xls\Fig 20a_b

A) Dissolved Phase VOC Mass



B) Total VOC Mass (Dissolved plus Sorbed)



Notes:

1. TVOC mass is estimated as the sum of TCE, cDCE and VC (i.e., does not include CFC113).
2. Mass of each VOC in the treatment zone plume is the sum of the estimated mass in each zone (upper, middle and lower). VOC mass in each zone is estimated using the average VOC concentrations at all monitoring locations in that zone and the volume of groundwater in the zone.
3. TVOC mass with sorption is estimated using compound-specific retardation coefficients for each zone.

**Treatment Zone TVOC Mass Estimates
over Operation of the DEM/VAL
Launch Complex 34, Cape Canaveral, FL**



Figure

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5.7.8.2 Electron Donors - nBA and nBuOH, TOC and VFAs

The concentrations of nBA, nBuOH, VFAs and TOC are tabulated in Table E-1-6 and plotted in time-series figures in Attachment E-2 for each monitoring location. Donor concentrations observed at the central extraction wells, RW0007 and RW0008 in terms of the amount of carbon (i.e. mmol C/L) indicates the PED was a suitable electron donor and provided a sustained source of donor (refer to Tables E-5-5 and E-5-10 in Attachment E-5).

In water, nBA undergoes hydrolysis to form acetate and n-butanol. The n-butanol is utilized by fermenting organisms to produce butanoate, acetate, and hydrogen. Early time data, collected 9 days after completing the PED injection (PED injection occurred over a 9 day interval from 20 June 2011 to 28 June 2011), indicated that, on average, n-butanol made up 38% of the total nBA equivalents detected in groundwater (the proportion of total nBA equivalents that was n-butanol ranged from 14% to 54%). After an additional 24 days (on 01 August 2011 & 02 August 2011), n-butanol comprised 84% of the total nBA equivalents detected. These data suggest that nBA underwent relatively rapid hydrolysis following its introduction to the DEM/VAL plots. Very little nBA was detected in groundwater samples collected from the extraction wells after the Biomass Growth phase; low concentrations were observed at the extraction wells during the Week 1 sampling (refer to Table E-1-5 in Appendix E), three days after groundwater recirculation was initiated, but not beyond that. At the Month 3 synoptic sampling, nBA was only observed at two of the bundle monitoring locations, BW0001B and BW0001D. nBuOH was present in extracted groundwater from RW0008 for only two weeks following system start-up and from RW0007 for four weeks. nBuOH was not detected in week 6, although low estimated concentrations of nBuOH were subsequently observed at RW0007 during weeks 8 through 12 suggesting that hydrolysis occurred.

Despite the relatively quick depletion of the nBA and nBuOH, the concentration of TOC did not decline as rapidly. TOC concentrations were sustained in both the upper and lower sweep zones, with the TOC concentration in the upper zone (RW0007) remaining above 100 mg/L through week 28 while in the lower zone (RW0008) remaining above 40 mg/L through week 28. After six more months of operation, TOC in the upper unit had decreased to 9.6 mg/L, or just above background levels, while in the lower unit the TOC declined to 27 mg/L.

VFAs accounted for most of the TOC, with acetate and butanoate being the most abundant VFAs identified in groundwater samples, along with minor amounts of propionate. When present, such as at early time, nBA and/or nBuOH contributed to the TOC. While acetate was a major component of the VFA, there was a significant contribution from butanoate, particularly in the upper zone. At RW0007, butanoate represented an average of 46% of the carbon occurring as VFAs over the initial 28 weeks of operation; the proportion was as high as 58% in week 4, declining to 27% by week 28. At RW0008, butanoate represented a smaller proportion of the VFA carbon, averaging 21% over the 28 weeks of recirculation, with a high of 47% in the first week declining to about 7% by the end of the DEM/VAL in week 28. Propionate made up 2 to 3% of the VFAs (as carbon) in both zones. The reason for the different relative composition of

the VFAs in the upper and lower zones is not known, but may reflect differences in the microbial populations responsible for fermentation of the various donor compounds. The difference may also reflect differences in the amount of nBA partitioned into NAPL and/or sorbed to the matrix; if more nBA was in fact sequestered in the upper zone, the higher proportion of butanoate observed here may have been the result of sustained release of nBA from residual NAPL and/or sorption sites.

The fact that nBA addition leads to the sustained supply of butanoate is a noteworthy feature of the technology. Soluble donors such as lactate and ethanol are more quickly consumed and TOC in these systems is quickly dominated by acetate. Also, butanoate has been shown to result in less methanogenesis than ethanol or lactate, because butanoate produces lower levels of hydrogen (Fennell et al., 1997).

5.7.8.3 Tracers

The tracer data is presented and analyzed in Appendix E. The concentration of bromide in extraction well RW0007 was always higher than that from RW0008, on average by a factor of about 3 (refer to Table E-1-6). The greater sustained concentrations at RW0007 suggest that more bromide mass was introduced to the upper sweep zone than the lower. No iodide was ever detected in monitoring locations in the lower zone, indicating that there was no significant movement of fluid from the upper sweep zone to the lower sweep zone. It was also noted that differences in the iodide and bromide recovery suggest that iodide may not have been conservative in the upper demonstration area.

Because PED was not detected in many samples after the first few weeks of operation, the bromide data was of limited utility to estimate partitioning. It did however serve as a tracer of the injection fluid and could be used to estimate the amount of blending that had occurred.

Average tracer concentrations at the end of the Main Recirculation Phase were used to estimate how much groundwater had been recirculated relative to the pore volume (refer to Appendix E). For the upper zone, this resulted in a rough estimate of 1.9 sweep zone pore volume replacements, which is in agreement with the estimate based on area and depth (refer to Appendix C). For the lower zone, this resulted in a rough estimate of 0.9 sweep zone pore volume replacements, which is somewhat lower than the estimate based on area and depth (refer to Appendix C).

5.7.8.1 Field Parameters

The field parameter data is summarized in Appendix E. The pH was generally about 7.5, varying somewhat spatially and temporally, but without apparent trends. Maintenance of neutral pH is conducive to promoting reductive dechlorination. The oxidation reduction potential (ORP) and dissolved oxygen (DO) concentrations indicated that suitable reducing conditions (ranging from sulfate reducing to methanogenic) were maintained throughout the DEM/VAL. Toward the

end of the Interim Measure Recirculation Phase, the ORP became less negative in the upper zone and DO concentrations increased slightly, to about 1.0 mg/L in both zones.

5.7.8.2 Geochemical Indicator Parameters

The geochemical indicator data, including DHG concentrations, is summarized in Appendix E. The methane and ethane data, as well as the sulfate and sulfide data for each monitoring location are plotted in the 'd' series of figures in Attachment E-2. Ethene is plotted with the chlorinated ethenes in the 'a' series of figures in Attachment E-2.

Production of ethene was observed in both the upper and lower zones, confirming that complete dechlorination of the parent VOCs (TCE, cDCE) through VC was occurring. Ethane was detected at many locations following PED addition. For example, at Month 3, the average ethane concentration in the upper zone was 25 µg/L, while in the lower zone it was 5 µg/L. Ethane is produced by the reduction of ethene, which is produced from dechlorination of TCE, cDCE and VC.

Methane was present in the groundwater from the beginning of the DEM/VAL, in the upper zone more so than the lower, with average baseline concentrations of 80 µg/L and 7 µg/L, respectively. Methane concentrations increased significantly over the course of system operation in both the upper and lower zones (refer to Appendix E). For example, at the Month 7 synoptic event, the average concentrations of methane were 290 µg/L and 330 µg/L in the upper and lower zones, respectively.

Sulfate concentrations were generally observed to decrease, while sulfide concentrations increased, indicating that the reducing conditions created by the addition of the PED stimulated indigenous sulfate reducing bacteria (refer to Appendix E).

5.7.8.3 Metals

Concentration data for dissolved Arsenic, Iron and Manganese over the course of the DEM/VAL are presented in Appendix E (Table E-1-8 in Attachment E-1). These species are known to be redox sensitive and are more mobile in their reduced forms. Dissolved Arsenic was not detected; dissolved Iron was observed initially at low levels; and dissolved Manganese was observed in most samples at low concentrations of 20 to 30 µg/L (below the FDEP GCTL of 50 µg/L). Manganese concentrations generally reached peak values at the end of the Biomass Growth Phase and then returned to background levels.

5.7.8.4 Molecular Characterization

The results of microbial characterization are presented in Appendix E (Table E-1-10 in Attachment E-1). Groundwater samples were analyzed to determine the presence and abundance of *Dhc* organisms, microbes that are capable of reductive dechlorination of chlorinated ethenes. Six locations were monitored over the course of the DEM/VAL, three in the upper sweep zone

(BW0001C, BW0003C and RW0007) and three in the lower sweep zone (BW0001E, BW0003E and RW0008). Baseline samples indicated that TCE-dechlorinating bacteria are native to the site; however, the number of *Dhc* organisms was relatively low. The Month 3 samples showed significant increases in *Dhc* organism numbers, with similar results over the course of the DEM/VAL indicating that the microbial population was sustained by the electron donors available with the plots.

In addition, the vinyl chloride reductase (*vcrA*) assay results confirmed that the native *Dhc* was capable of degrading VC to ethene efficiently. Data from the extraction wells indicated that initially the *vcrA* component made up only about 5% of the *Dhc*, but that over the course of operation the proportion of *Dhc* organisms that contained the *vcrA* component grew to be essentially 100%. This suggests that by Month 10 the entire *Dhc* microbial population had the capability of degrading vinyl chloride to ethene efficiently.

6 PERFORMANCE ASSESSMENT

6.1 EASE OF IMPLEMENTATION (QUALITATIVE)

To increase the likelihood that the PED technology will be adopted as an approach to source zone bioremediation, it should be straightforward to implement. Ease of implementation using standard equipment and application methods is an important benefit of the PED technology.

The ease of implementation was evaluated based on the experience of field staff and the actual availability and costs of installed equipment. The success criterion for this objective is that PED amendment to the source area is effectively achieved using readily available equipment.

This objective was achieved based on experience with the actual injection of nBA (the PED) at the Site. PED was successfully introduced to the source area using readily available direct-push injection equipment. The injection contractor performed essentially standard injections with a few extra precautions (e.g. bonding and grounding) for handling the pure nBA. Field application of nBA was deemed comparable to traditional soluble donor amendment in terms of equipment, time and effort, once the field crew were educated about nBA handling. The equipment required for the solar-powered recirculation system was also standard issue, readily available through local suppliers and assembled by technicians with training in basic plumbing techniques. Ease of implementation using standard equipment and application methods is an important benefit of the PED technology, since this facilitates it being adopted as an approach to source zone bioremediation.

6.2 ABILITY TO PROMOTE BIODEGRADATION (QUALITATIVE)

To be effective, the PED must have promoted biodegradation of the target contaminants. The reduction in contaminant mass is a function of the degree to which biodegradation was promoted in the subsurface. Due to budget constraints, a new control plot was not established for the DEM/VAL, but the project used the results from a prior pilot-scale demonstration at LC34 (Battelle, 2004; Hood et al., 2008) to compare PED efficiency to a soluble donor system (the previous study used ethanol). Addition of any electron donor can promote growth (biomass) which will in turn accelerate the consumption rate of donor (i.e., the donor consumption rate will vary in time and space) and as such it was not possible to statistically assess equivalent bioactivity between the prior study and the PED demonstration. Note that the goal was not to stimulate equivalent bioactivity – the prior LC34 demonstration experienced biofouling and maintenance to control biofouling was a significant cost. The goal was to demonstrate that the PED (nBA) could be utilized by the native dechlorinating microorganisms and had the ability to promote biodegradation of TCE.

The ability to promote biodegradation using the PED technology was evaluated on the basis of increases in the concentrations of dechlorination breakdown products and increases in the

population of microorganisms capable of dechlorination. Reductions in concentration of the parent compounds also contributed to the evaluation of biodegradation activity.

Groundwater samples were collected prior to donor amendment to establish baseline VOC concentrations and microbial numbers; groundwater samples were then collected over time during the demonstration to monitor changes in concentration and/or microbial numbers.

This objective was confirmed by the increases in the concentration of degradation products (cDCE, VC and ethene) from the reductive dechlorination of TCE and increases in the population of dechlorinating microorganisms in response to PED addition (Figure 4). In both the upper and lower demonstration areas, sustained production of dechlorination products, including ethene, was observed, demonstrating that the PED (nBA) could be utilized by the native dechlorinating microorganisms and thus had the ability to promote biodegradation of TCE.

6.3 LONGEVITY OF ELECTRON DONOR SUPPLY (QUALITATIVE)

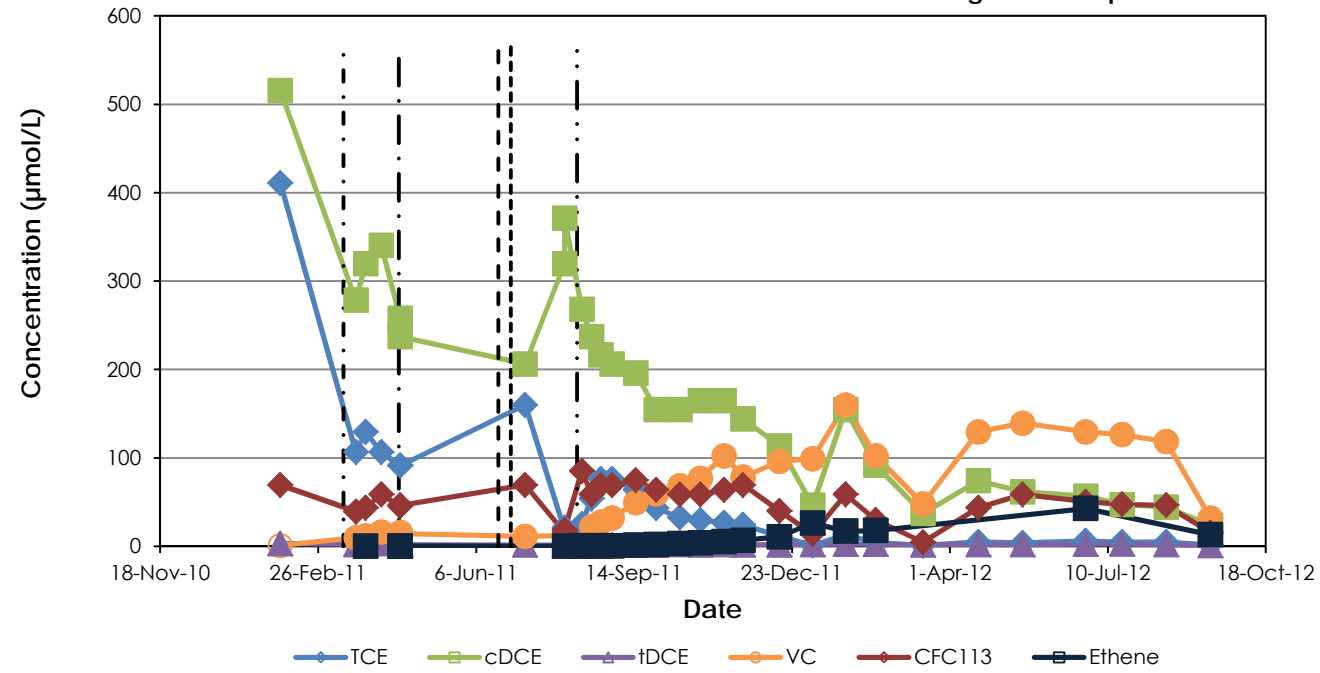
Longevity of electron donor supply was assessed using the same time-series groundwater concentration data collected for assessment of several of the other objectives, namely the concentrations of remaining nBA, donor breakdown products (including n-BUT from nBA), VFAs, and TOC. Sustained donor supply from a one-time addition of PED is desirable, as it requires reduced frequency of donor replenishment.

This objective was confirmed by the persistence of electron donor equivalents throughout the DEM/VAL operation (see Section 5.7.8.2). The concentrations of nBA, nBuOH, VFAs and TOC are presented in Table E-1-7 and plotted in time-series figures in Appendix E for each monitoring location. Figures 22a and 22b show the VOC and donor trends for RW0007 and RW0008. Donor concentrations observed at the central extraction wells, RW0007 and RW0008 in terms of the amount of carbon (i.e. mmol C/L) indicates the PED was a suitable electron donor and provided a sustained source of donor (refer to Tables E-5-5 and E-5-10 in Appendix E). Measured TOC concentrations were generally equal to the sum of the individually quantified components. For example, at RW0007 the TOC concentration was, on average, 91% of the sum of the VFAs plus other carbon-containing compounds (nBA, nBuOH, VOCs and DHGs) and at RW0008, the TOC concentration was 99% of the sum of the VFAs and other measured carbon-containing compounds. TOC alone was monitored in the follow-on IM phase of operation, as it gave sufficient means to monitor the donor availability within the DEM/VAL plots.

The total TOC added to the system was 238 kg (from 384 kg of nBA). This equates to 119 kg to the upper zone, 37.5 kg to the silty clay zone and 83.3 kg to the lower zone. Figure E-4-3 in Appendix E shows the cumulative mass of TOC extracted from RW0007 and RW0008, respectively. These results were estimated by summing the product of the average TOC concentration and the volume of groundwater extracted between sampling events. The analysis was extended beyond the DEM/VAL, although TOC concentrations were only measured on two occasions, in weeks 47 and 58. Considering the results together, the cumulative mass of TOC

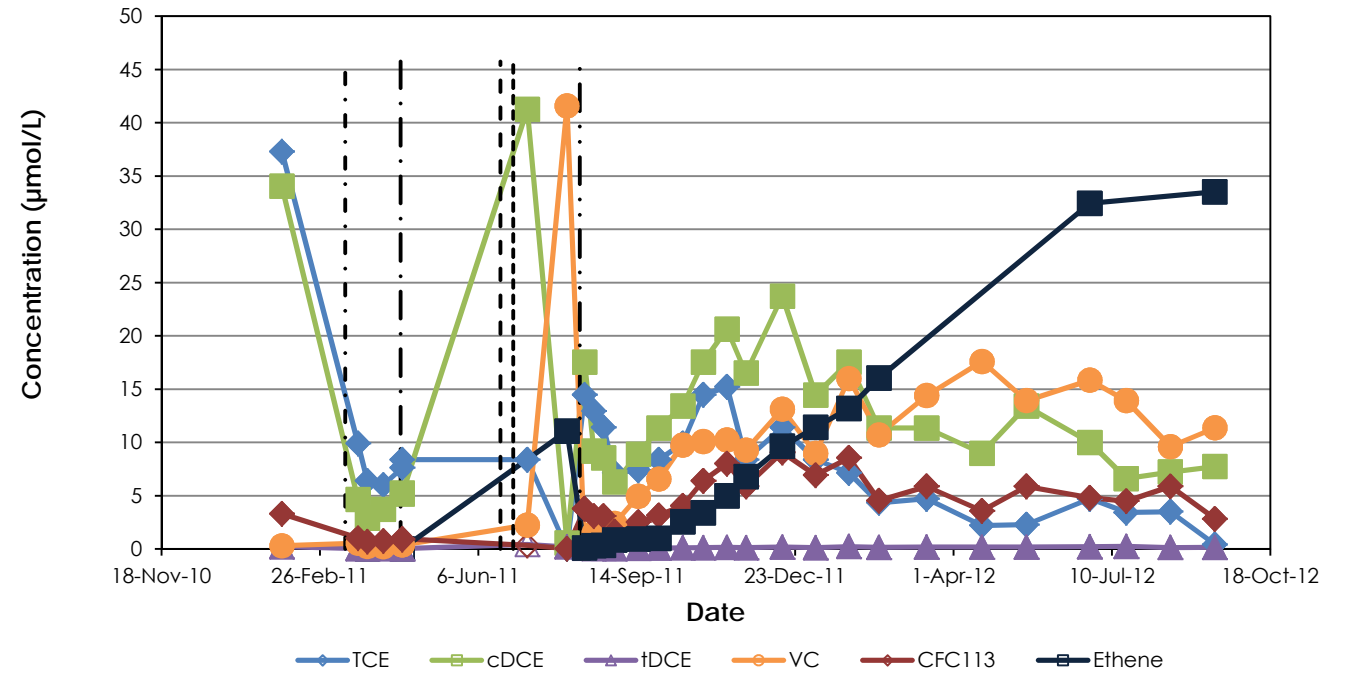
22a) RW0007

Volatile Organic Compounds

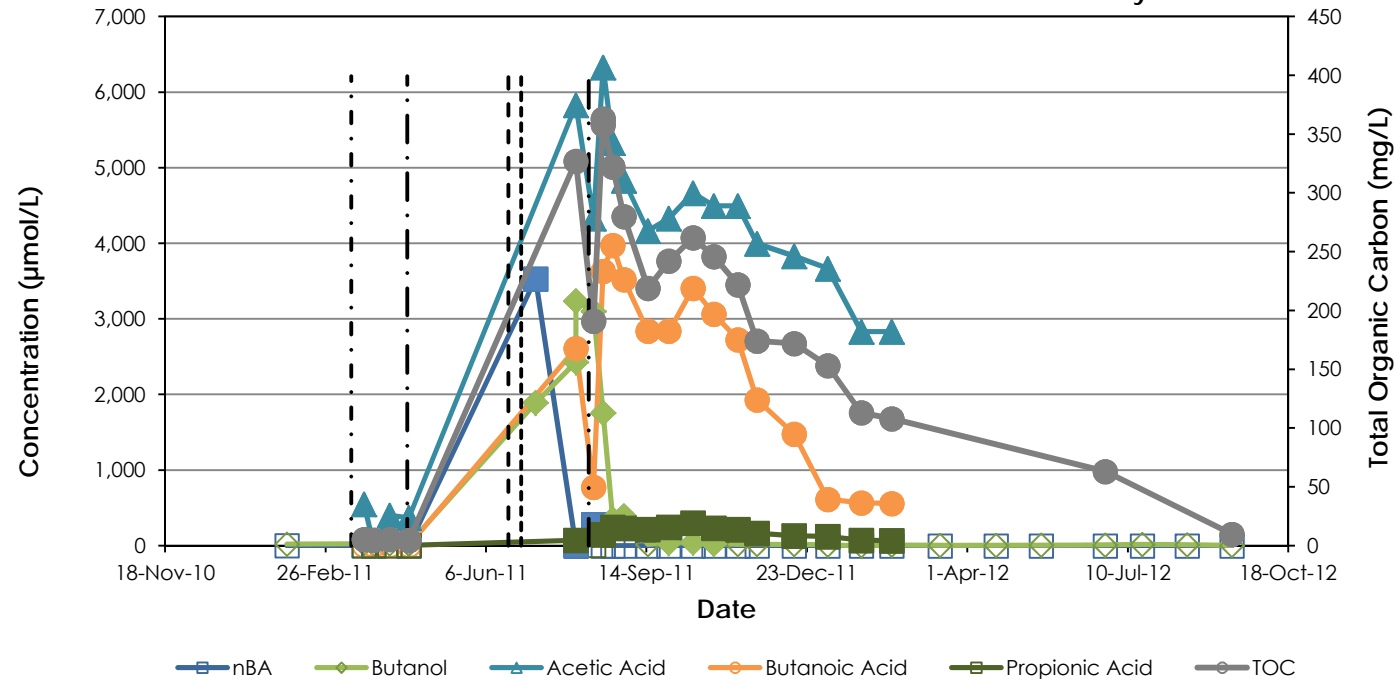


22b) RW0008

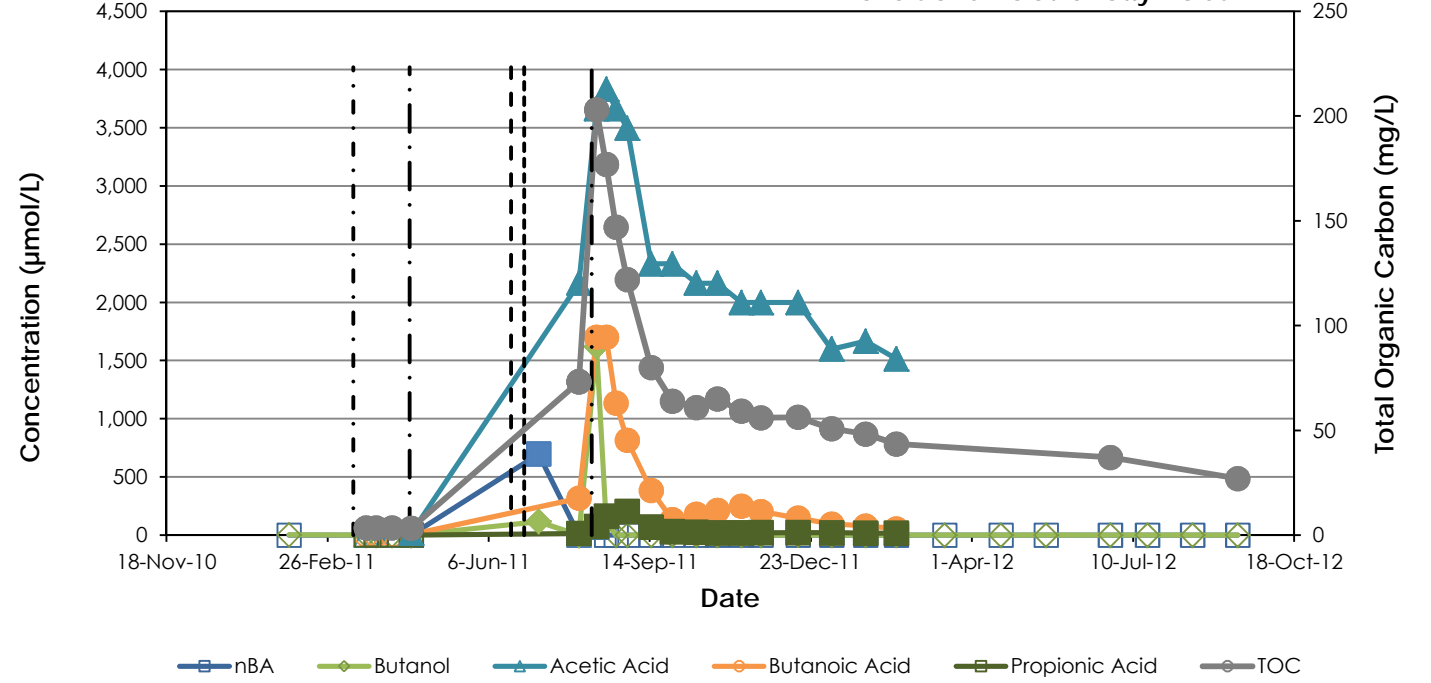
Volatile Organic Compounds



Donors and Volatile Fatty Acids



Donors and Volatile Fatty Acids



Notes:

- µmol/L - micromoles per liter
 - mg/L - milligrams per liter
 - cDCE - cis-1,2-Dichloroethene
 - CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 - nBA - n-Butyl acetate
 - TCE - Trichloroethene
 - tDCE - trans-1,2-Dichloroethene
 - TOC - Total Organic Carbon
 - VC - Vinyl chloride
 - Hollow symbols represent non-detects presented at the
- · - Start Baseline Recirculation
 - · - End Baseline Recirculation
 - - - Start nBA Injection
 - - - End nBA Injection
 - · · Start Main Recirculation

VOC, Donor and VFA Time Trends
RW0007 & RW0008
 Launch Complex 34, Cape Canaveral, FL



Figure

22

Guelph

October 2013

extracted was greater than the total mass of carbon in the nBA injected, which is an expected consequence of the recirculation of groundwater. When considering each separately, the mass of TOC extracted from the upper and lower zones exceeded the mass of nBA (as TOC) delivered to each zone respectively. This implies biomass grown in place may be enhancing the TOC.

6.4 PED PARTITIONS INTO THE DNAPL (QUALITATIVE)

The partitioning of PED into DNAPL was evaluated using groundwater analyses for conservative tracers (bromide and iodide), nBA and nBuOH, and TOC following PED injection. In the TDP (Lebrón and Major, 2011), it was suggested that nBA and VOC concentrations in soil would be analysed as well, but this was deemed impractical, as it would not be possible to determine whether the nBA and VOCs were in a NAPL phase or not. Because baseline soil data for VOCs showed considerable spatial variability and the presence of DNAPL was not confirmed, it was considered infeasible to attempt to quantify nBA within TCE-NAPL through soil sampling.

This performance objective was met. Although data collected in the field DEM/VAL did not have sufficient resolution to demonstrate PED partitioning into DNAPL the partitioning phenomenon was clearly demonstrated in the laboratory column experiments (Cápiro et al., 2011 and the laboratory summary report). The major reason for the apparent difference in behavior, between laboratory and field, is the amount of NAPL present in each case. As discussed in the TDP, the change in the aqueous concentrations of nBA should be proportional to the mass of residual NAPL present. In the laboratory column tests, the emplaced NAPL zone occupied 10-15% of the pore space. At this relatively high saturation, the NAPL phase can sequester a significant amount of nBA, resulting in a relatively large decrease in the aqueous phase concentration of nBA that can be readily detected. In contrast, the DEM/VAL field plots had low residual NAPL saturation (in fact, the degree of saturation could not be determined), such that only a relatively small amount of nBA would need to partition from the aqueous phase to establish equilibrium between the aqueous phase and any NAPL phase droplets. If only a small amount of nBA was sequestered from the aqueous phase, the resulting decrease in the concentration of nBA would be small and difficult to discern in the field data.

In the field, combined recovery of nBA and nBuOH shortly after PED injection (data collected 07-Jul-11 from 10 monitoring locations) was, on average, 93% of the bromide tracer recovery, suggesting some partitioning and/or sorption. Also, any additional breakdown products from the nBA were not accounted for, since TOC measurements were not collected at this time. Furthermore, there was considerable variation in relative recovery between monitoring locations, such that the standard deviation was 47%. Because of this, there is little confidence in the interpretation of the observed difference in terms of partitioned nBA. Later data is difficult to assess in this manner due to breakdown of the nBA, although the recovery of TOC relative to tracer gives some idea.

The 93% relative recovery is perhaps higher than might be expected once sorption of nBA to organic carbon in the aquifer is taken into account. Using the fraction of organic carbon determined on soils samples (Appendix E), a retardation factor of 1.4 was estimated for the upper sweep zone, suggesting that at equilibrium approximately 30% of the nBA might be expected to be sorbed to the matrix. When the aqueous nBA concentrations are scaled by a factor of 1.4 (with no scaling of the nBuOH since it is not expected to sorb strongly), the relative recovery of nBA and nBuOH is estimated to be 1.16 (± 0.57).

6.5 PED PARTITIONS OUT OF THE DNAPL AT A SUITABLE RATE AND CONCENTRATION (QUALITATIVE)

The applied PED, once partitioned into residual DNAPL phases and onto sorption sites, must be released to groundwater at a rate and concentration that is sufficient to support bioremediation. The success of the technology relies on creating a sustained donor supply that matches the release of contaminants. The PED partitioning rate will be considered suitable if it occurs over the timeframe of the period of evaluation.

Assuming that PED partitioning into DNAPL is successful, the expectation is that PED will be released back to groundwater when dissolved-phase PED concentrations decrease as the un-amended groundwater is pulled into the treatment area due to removal from the central extraction wells. The intent is that this will sustain concentrations of nBA and/or its breakdown products that are greater than would persist in a soluble donor system after a pore volume of water has been extracted. In a soluble donor system, the donor will be removed with groundwater. In the PED system, donor is re-supplied from the DNAPL phase (and sorptive sites).

Assessment of this objective required use of nBA concentrations in groundwater over time, nBuOH concentrations, VFA and TOC concentrations, and VOC concentrations in groundwater. The assessment was not straightforward, as the nBA was actively consumed as it migrated toward the extraction well; however, evidence of sustained donor supply provided by the presence of dechlorination products should also support the evaluation. Changes in the amount of DNAPL dissolution were assessed by comparing the total flux of VOCs observed at the central extraction wells before and after application of the PED.

This performance objective was considered met. Sustained concentrations of electron donor (TOC and VFAs) were observed, with production of dechlorination products. Microbial numbers also increased. For the upper zone, the presence of elevated concentration of CFC-113 (which can inhibit dechlorination) and high initial concentrations of cDCE would mask the increase we wanted to observe. In the lower zone a sustained increase in total VOC mass flux was observed. Both upper and lower zones had near complete removal of TCE, only one location (BW0001D) had TCE remaining at the end of the DEM/VAL.

6.6 ABILITY TO DELIVER PED INTO THE SOURCE AREAS (QUANTITATIVE)

One objective of the PED DEM/VAL was to demonstrate that the PED can be readily delivered to the source area. In order to be an effective bioremediation approach, the application of PED should have been reasonably comparable to that of other traditional electron donors, so that its other properties can provide an overall benefit. The ability to deliver the design quantity of PED into the source area was expected to be comparable to that of other electron donors.

The objective was to be considered met if the design quantity of PED-amended fluid was delivered to the target zones within a reasonable amount of time (hours), using reasonable injection pressures. The success criterion was to amend at least 75% of the target volume (33,600 gal). This performance objective was met. The injection program successfully delivered the target volume and concentration of PED-amended fluid to the target zones: 34,000 gal of injectate containing 3,000 mg/L nBA with bromide and/or iodide as tracers was injected.

An additional consideration for this objective was that the post-injection concentrations of nBA, in soil and groundwater, would be well distributed following amendment. This objective was also met.

The ability to deliver the design quantities of PED to the target zones of the source area was assessed during installation, through observation of field implementation and monitoring of injection pressures and flow rates. Following amendment injection, the achieved distribution of PED was assessed through post-injection sampling of groundwater for tracers and nBA.

6.7 INCREASED DNAPL DISSOLUTION (QUANTITATIVE)

The PED technology is designed to provide electron donor at the NAPL:water interface to promote growth of dechlorinating biomass as close to the source of dissolved-phase VOCs as possible. By promoting and supporting reductive dechlorination close to the NAPL:water interface, the PED creates a steep concentration gradient between the NAPL and the aqueous phases, which results in increased DNAPL dissolution.

The amount of DNAPL dissolution was assessed by comparing the mass discharge of VOCs before and after application of the donor. Mass discharge is an integrated estimate of the mass flux, representing the total mass of any solute conveyed by groundwater through a plane, in this case a cylindrical surface around the extraction well. One advantage of this method is that the extraction well effectively integrates flow and concentration so that even small concentration hot spots and high-transmissivity zones are captured by the well and included in the estimate (ITRC, 2010). Typically this approach requires that the pumping well not increase the flow through the source zone, which might increase the dissolution rate (concentrations may or may not change), pumping be continued long enough that relatively steady-state conditions are achieved, and capture of the high-discharge portions of the plume must be complete or near-complete (ITRC, 2010).

The mass discharge was calculated from the groundwater VOC concentration data and the pumping rate and volume data. The total amount of TCE equivalents was calculated as the sum of TCE and its breakdown products, on a molar basis. The product of these measured concentrations and the volumetric pumping rate yielded an estimate of the total mass discharge rate. Using the pumped volumes, estimates of cumulative total mass discharge over time were determined. Changes in the total amount of TCE equivalents over time indicated changes in the rate of DNAPL dissolution. Interpretation was complicated by the fact that extracted groundwater was re-injected in the peripheral ring of injection wells without removing VOCs (or donor); dissolved species in groundwater removed from the extraction wells were re-introduced to the aquifer at the perimeter of the sweep zones. Estimates of the relative amount of recycle were obtained from comparison of the pumped volumes to estimates of the sweep zone pore volume, the tracer data and the TOC data.

It was expected that the PED plot would have increases in total VOC concentrations following amendment with nBA (relative to baseline). This increase in total VOC mass flux would be a primary indicator that the PED application worked as intended. The objective was to be considered met if the increase in total VOC mass flux observed in the PED plot was 50% or greater than that typically observed at sites where soluble donor was applied.

The result was partially confirmed. In the lower zone there was an increase in the total VOC mass flux to the extraction well. In the upper zone there was not an increase in total VOC mass flux to the extraction well. The lower zone enhancement factor was in the range for a typical donor application. DNAPL was not confirmed (i.e., observed) in the pilot test but the data collected indicate that there were additional TVOCs in the system.

Although the presence of DNAPL within the field plot was not confirmed the dissolved concentration data showed increases in the total amount of VOCs in some locations. Time trend plots of the VOCs at extraction wells RW0007 and RW0008 are presented in Figure 3. Appendix E contains time trend plots for the other monitoring well locations. The upper zone did not experience an increase in total VOC mass discharge at the extraction well, even though there was a definite shift towards lesser-chlorinated degradation products, as illustrated by the extent of dechlorination calculation shown in Figure 4. A number of factors may have contributed to this, including:

- Sustained elevated concentrations of cDCE;
- Sustained elevated concentrations of CFC113; and
- Distribution of TCE (and CFC113) – most of the mass was found at BW0001 upon installation and RW0007, suggesting there may have been DNAPL in that portion of the demonstration area, but not uniformly around the extraction well, so that the pumped groundwater represents a blend of water that passed through a source zone where contact with residual DNAPL was possible, and other water that came

from/through other portions of the demonstration area(s) where there was little TCE NAPL to contact.

The lower zone did experience an increase in total VOC mass discharge at the extraction well. The concentration trend is presented in Figure 20b. This figure shows that the increasing total VOC mass in extracted groundwater was due to increasing amounts of TCE degradation products.

The lower zone enhancement factor was in or above the range for a typical donor application. Data from RW0008 showed that, during the first three months, the ratio of TVOCs to the concentrations observed during the baseline recirculation phase was on average 2.4 times greater. The TVOC ratio increased to an average of 4.1 times over the next four months (i.e., months 4 through 7). Data collection during the subsequent Interim Measure Recirculation Phase was not as frequent, but at months 10 and 13, the TVOC ratio was 5.3 and 4.4, respectively.

6.8 IMPROVED EFFICIENCY OF ELECTRON DONOR UTILIZATION (QUANTITATIVE)

Because the PED will partition into residual DNAPL, and partition back into groundwater along with VOCs as they dissolve from the NAPL-phase, the electron donor may be preferentially utilized by dechlorinating bacteria. Hence, a greater proportion of the amended PED was expected to be used to support reductive dechlorination of VOCs rather than untargeted reactions (e.g., methane production).

The efficiency of electron donor utilization was assessed using the groundwater concentrations of VOCs, electron donors, breakdown products, and dissolved hydrocarbon gases (DHGs) over time. The parent donor compound, nBA, along with its breakdown products (n-butanol, acetate, and other VFAs), were monitored, in addition to the VOCs and their breakdown products, plus other compounds that may have formed, such as methane, so that a detailed understanding of the donor consumption pathways was ascertained.

The objective would be considered met if the 'utilization ratio' is greater for PED than is typically observed with traditional soluble donors. The success criterion will be an observed increase in utilization ratio of 50% or greater relative to the soluble donor system of the prior LC34 study (Battelle, 2004; Hood et al., 2008). That is, the units of TCE dechlorinated to units of ethanol applied for soluble donors will be compared to the units of TCE dechlorinated in the PED plot to units of PED applied).

The PED lasted longer than a soluble donor, several pore volume flushes were completed and if the donor was soluble it would have been extracted from the system. However, determining that the PED was more than 50% better than a soluble donor was not quantitatively determined. In the upper sweep zone significant cDCE was present at the start of the DEM/VAL and so production of cDCE from PED addition was not simply calculating the cDCE increase. This was not the case for the LC34 study. There were also elevated concentrations of CFC113 in many of

the collected groundwater samples which can inhibit dechlorination which would also limit confirmation of the objective. Nevertheless, the PED can be considered similar to other long term electron donors (e.g., emulsified vegetable oils) over the benefits of soluble donors (e.g., lactate or ethanol).

6.9 REDUCTION IN DNAPL MASS IN THE SOURCE AREA (QUANTITATIVE)

One goal of source zone bioremediation is to reduce the amount of DNAPL remaining in the source area, to reduce the expected time for clean-up. Reduced source mass may also result in reduced VOC loading to the downgradient plume.

Assessment of this objective was based on the baseline and final VOC concentrations in soil and groundwater. If the PED is able to partition effectively into residual DNAPL and this promotes bioactivity then a decrease in soil VOC concentrations should occur. This may increase groundwater VOC concentrations (in part due to production of daughter products).

The objective was confirmed based on the interpolated TVOC mass in the treatment zone. Figure 21 presents the interpolated TVOC mass accounting for sorption; there is a significant decline in TVOC mass, estimated to be a 77% reduction (Attachment E-6 in Appendix E). The sparse data set of soil samples, targeting specific locations, suggest there are some changes in TVOC but changes may not be sufficient to discern changes in TVOC mass across the entire treatment area.

6.10 REDUCE OPERATION AND MAINTENANCE COSTS (QUANTITATIVE)

A major feature of the PED technology is the reduced frequency of donor replenishment, the commensurate reduction in application costs, and the shorter remedial timeframes, resulting in lower operation and maintenance (O&M) costs, anticipated due to increased rates of DNAPL dissolution. The success of the PED technology depends on the degree to which these reductions in the number of applications and in the cost of operation and maintenance can be realized.

The reduction in operation and maintenance costs was estimated on the basis of the data collected during the DEM/VAL, including the costs for materials, labor and analytical costs. The time of operation relative to operation with a soluble donor was extrapolated using apparent DNAPL dissolution rates to estimate remedial timeframe. The observed longevity was used to estimate the frequency of re-amendment, to estimate costs over the lifetime of the remedy.

This performance objective was generally confirmed. The PED remained longer in the groundwater compared to a simple soluble donor (e.g., lactate) and promoted dechlorination. After 8 months of recirculation there was still enough residual organic carbon to promote bioactivity. On this basis we can conclude that the donor lasted longer than estimated, with no significant biofouling issues and hence less frequent donor addition and maintenance with the

PED over a soluble donor. Given this it would be likely that the PED will provide a shorter remedial timeframe but it is not exactly known if this will be a cost savings of 25% or more. However, the exact 25% reduction cannot be quantified, per se. At the end of the DEM/VAL VOC mass remained in parts of the test area and the time to completely treat remaining VOCs was not known.

7 COST ASSESSMENT

To assess and validate the expected costs of the PED technology, detailed cost information was tracked during the demonstration. This provides a cost summary for implementation of the technology and for comparing it to potential alternative technologies. An effort was made to identify and track cost elements unique to the PED technology so that the cost benefits of the PED technology could be assessed and realistic cost estimates could be made for implementation at a given site.

7.1 COST MODEL

The simplified cost model developed for the PED technology is presented in Table 5. The cost model reflects the elements that were incurred in the demonstration and that would be required to implement the technology for site remediation. In most cases, costs for the demonstration were greater than those anticipated for a typical application, due to extra efforts to collect sufficient data during the demonstration to validate the technology. Costs for implementing the technology at a selected site can be estimated using standard costs for the elements.

7.1.1 Cost Element: Laboratory Treatability Study

Although not absolutely required, a treatability bench scale evaluation would be conducted at most sites to determine the feasibility of implementing bioremediation at the site and to determine whether bioaugmentation was required. The cost listed in Table 5 represents the large-scope treatability testing conducted at Georgia Tech as a component of this DEM/VAL. This level of testing would not be necessary to assess a candidate site for implementation of the PED technology. Instead, a relatively straightforward evaluation of the applicability of bioremediation at a given site would be performed, costs for which should be included to properly compare the PED bioremediation technology to other source zone remediation technologies. Typical treatability study costs include the costs for collecting site soil and groundwater, setting up microcosms, and sampling and laboratory analysis.

7.1.2 Cost Element: Infrastructure Installation

The costs for infrastructure installation included the construction of the monitoring, injection and extraction wells plus the solar-powered groundwater recirculation system. These costs will be somewhat site-specific, as the numbers of wells and the costs to install them will depend on site characteristics (e.g., depth of wells, lithology, size of source area, etc.). A recirculation system, solar-powered or conventional, is not required, but proved useful for the DEM/VAL. In practice, the PED technology could be implemented in a range of scenarios from passive (i.e., no recirculation) to fully active (continuous recirculation, with or without routine PED addition).

TABLE 5. COST MODEL FOR APPLICATION OF PARTITIONING ELECTRON DONORS
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Cost Element	Data Tracked During the Demonstration	Estimated Costs	
Laboratory Treatability Study	· Costs for collection of Site soil and groundwater	Total	\$ 100,000
	· Costs for treatability study in lab		
	· Materials		
	· Labor costs		
	· Laboratory analytical costs		
Infrastructure Installation	· Drilling (subcontractor)	Labor	\$ 33,534
	· Equipment costs	Expenses (including subcontractors)	\$ 57,080
	· Labor costs		
Baseline Sampling	· Laboratory analytical costs	Labor	\$ 4,742
	· DPT sampling (subcontractor)	Laboratory Analytical	\$ 5,175
	· Labor costs	Expenses (including subcontractors)	\$ 806
Installation and Amendment	· Direct push injection costs (subcontractor)	Labor	\$ 21,095
	· Material costs - Electron donor & Tracer	Electron Donor	\$ 3,065
	· Labor cost	Tracers	\$ 2,007
		Laboratory Analytical	\$ 6,484
		Expenses (including subcontractors)	\$ 59,810
Waste Disposal	· Investigation derived waste disposal costs	Expenses	NA
Operation and Maintenance	· Cost of labor for standard O&M	Labor	NA
	· Additional materials or labor costs for troubleshooting etc.	Expenses	NA
Performance Sampling	· Labor costs	Labor	\$ 50,713
	· Direct push soil sampling costs (subcontractor)	Laboratory Analytical	\$ 69,606
	· Laboratory Analytical Costs	Other Expenses	\$ 15,261
Regulatory/ Permitting	· UIC permit was obtained for NASA IMWP		
Total			\$ 429,377

7.1.3 Cost Element: Baseline Sampling

Baseline sampling costs included costs for collection and analysis of soil and groundwater samples. In practice these costs will be somewhat site specific since the number of samples and target analytes will vary. It should also be noted, that costs for baseline sampling would apply regardless of technology selected for a site's remedial approach.

7.1.4 Cost Element: Installation and Amendment

This element included costs for the materials (nBA and tracers), PED injection (injection contractor, oversight) and confirmation sampling (sample collection, analytical). These costs can be expected to vary between sites.

DPT injection was used to deliver the PED into the subsurface throughout each pilot test area. This method of amendment delivery involved the costs for an experienced injection subcontractor and for oversight labor during installation. This included costs for suitable equipment and safety gear to properly handle the nBA in its pure form (e.g., bonding, grounding). Other than that, there were no costs that were unique to the PED technology.

The overall cost for implementation of the PED technology will depend on the required number of re-applications. This is reflected in the cost analysis below.

7.1.5 Cost Element: Waste Disposal

This is a standard cost element; hence, it was not tracked during the DEM/VAL. Typical IDW disposal considerations will apply. In this case, NASA paid for disposal and the analytical costs for characterization were included with groundwater sample events.

7.1.6 Cost Element: Operation and Maintenance

No unique requirements were encountered. The costs for routine O&M during the DEM/VAL were not tracked separately, but are included in the Performance Sampling element (i.e., are included in Task 3 and Task 6 costs). Standard O&M costs can be used to estimate this element for full scale application of the technology.

7.1.7 Cost Element: Performance Sampling

Standard groundwater sampling and direct-push soil sample collection were used for monitoring the performance of the PED technology. The performance sampling costs were part of the demonstration assessment and were not typical for normal implementation of the PED technology. The costs for the detailed program were tracked and reported in Table 5, including labor, materials and laboratory analysis.

Some level of performance monitoring is required for any remedial technology. Since there are no unique sample collection or analytical requirements, the costs for a typical program can be estimated from standard monitoring costs for full scale application of the technology.

7.1.8 Cost Element: Regulatory / Permitting

The regulatory and permitting requirements are likely to vary from site to site, depending on the region and agency responsible for regulatory oversight. For the DEM/VAL, an underground injection control (UIC) permit was obtained by NASA for their IMWP. The PED, nBA, may have an MCL in groundwater as it does in Florida. Estimates of typical costs for preparation of permit requests and permit fees can be used to estimate the cost of this element for full scale application of the technology.

7.2 COST DRIVERS

The costs to implement the PED technology for DNAPL source zone treatment will vary from site to site, depending on the size of the site (i.e., impacted volume) and several site-specific characteristics. The key cost drivers are listed below along with a brief discussion of the impact on cost.

- Area to be treated – additional electron donor and direct push locations would be required
- Depth of source area
- Vertical thickness
- Naturally occurring groundwater quality – high concentrations of other electron receptors will increase the amount of donor required
- DNAPL Mass and Distribution

Also consider:

- Lithology & permeability – delivery in sands will be easier than in low permeability. Permeable (higher hydraulic conductivity) sites are likely to be better candidates for recirculation as a means of delivery and hydraulic control.
- Ambient groundwater velocity – site with higher velocity will have greater flushing of donor and potential influx of additional electron acceptors, both of which may affect PED utilization

7.3 COST ANALYSIS

A comparison is made between the PED technology and the most comparable in situ source zone treatment technology, conventional source zone bioremediation using non-partitioning electron donors. A cost analysis was conducted to calculate expected costs to treat a hypothetical site

with PED compared to using EVO, a widely accepted electron donor. The hypothetical site was assumed to have the following characteristics:

- Sand aquifer (30% porosity) that is 30 ft deep and underlain by a clay aquitard;
- DNAPL source zone is 40 ft wide by 80 ft long by 15 ft deep (15 to 30 ft bgs); and
- 500 kg of TCE DNAPL is present

Because PED is intended to be a source zone remedy, the cost comparison developed considers only treatment of the source zone and not the plume. For consistency, it is assumed that in both scenarios amendment of electron donor would occur via direct push injection at 40 injection points, each with a 5 ft radius of influence, evenly distributed across the source area. For both scenarios, the target injection volume is 50% of the source zone volume, which is considered a realistic value to sufficiently distribute the applied donor (PED or EVO). The assumptions for the cost analysis are summarized in Table 6. The mass of donor required, frequency of injection and total treatment time were varied in accordance with the known properties of each donor. Complete source zone treatment requires a substantial amount of time. The analysis compares the PED and EVO approaches for initial source zone treatment, after which the two scenarios converge since beyond the initial timeframe further remediation may still be required, but each scenario would likely need similar efforts to complete treatment.

Table 7 shows the total estimated treatment costs for the two scenarios – PED versus EVO. The calculated costs assume that the DNAPL and Site were previously well characterized. The total cost using PED as the electron donor was estimated to be \$571,000, while the total cost using EVO was estimated to be \$679,000. The differences in overall cost are attributable to the cost of donor applied in each event (which is a function of the unit cost and amount of donor required; the estimated number of applications is the same in both cases) and the duration of the remedy, which governs the number of monitoring events. Since other costs are likely to be similar between the two technologies, the cost savings with the PED technology arises primarily from the reduced duration of the remedy. The shorter duration is directly related to the enhanced DNAPL dissolution promoted by the PED.

The PED technology is applicable to the majority of sites with DNAPL source zones. Acceptance of the technology may significantly reduce remediation costs. The PED technology may also alleviate the drive to use other more aggressive and costly technologies to treat source zones, for example, thermal and chemical oxidation. Although the cost analysis presented here considered direct injection, groundwater recirculation systems could also be used. Existing pump and treat systems could benefit from introducing PED to create a small biological degradation/containment zone in and around the source area. This would eliminate or significantly reduce the amount of groundwater extraction (and associated costs) required to maintain containment while reducing the overall treatment time.

TABLE 6. ASSUMPTIONS MADE FOR THE BASIS OF THE COST ANALYSIS

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

	PED		EVO	
	Value	Rationale	Value	Rationale
Assumed TCE Mass (kg)	500	Assuming 0.1% NAPL would give a TCE mass of 310 kg; Using the soil concentration of 300 mg/kg (which is NASA's concentration indicative of NAPL) gives a TCE mass of 650. Based on these a mass of 500 kg was selected/assumed.	500	Assuming 0.1% NAPL would give a TCE mass of 310 kg; Using the soil concentration of 300 mg/kg (which is NASA's concentration indicative of NAPL) gives a TCE mass of 650. Based on these a mass of 500 kg was selected/assumed.
Stoichiometric Donor Demand (kg)	83	Based only on TCE mass	64	Based only on TCE mass
Source Zone Volume (ft ³)	48,000	Assumes source zone is 40 ft wide, 80 ft long, and 15 ft thick.	48,000	Assumes source zone is 40 ft wide, 80 ft long, and 15 ft thick.
Depth of Aquifer (ft bgs)	30	Assumption	30	Assumption
Source Zone Pore Volume (ft ³)	14,400	Assumes porosity is 30%.	14,400	Assumes porosity is 30%.
Source Zone Pore Volume (L)	407,808		407,808	
Target Injection Volume (L)	203,904	Targets 50% of the pore volume.	203,904	Targets 50% of the pore volume.
Target Concentration of Injectate	3 g/L	Keep below nBA solubility (same as DEM/VAL)	1%	Typical oil concentration (from EVO) for source areas.
Target Mass of Donor into Formation (kg)	620		1,880	
Resulting Safety Factor	7	(Target Mass into Formation)/ (Stoichiometric Donor Demand)	29	(Target Mass into Formation)/ (Stoichiometric Donor Demand)
Injection Points	40	Direct push on 10 ft centers (assume 5 ft radius)	40	Direct push on 10 ft centers (assume 5 ft radius)
NAPL Dissolution Enhancement	1.5	PED vs. EVO	1	
Treatment Time (years)	6.7	Assumed treatment will be 50% faster than EVO due to dissolution enhancement	10	Assumed 10 years of treatment
Treatment Frequency	Four Applications	Applied more frequently than EVO (every 2 years) because less TOC mass is applied in each application	Four Applications	Every 2.5 years
Total Donor Mass to Inject (kg)	2,500		7,600	

Notes:

1. Treatment applications are fixed to four for each technology. Treatment time is variable.

TABLE 7. COST COMPARISON OF PED TECHNOLOGY TO EISB USING CONVENTIONAL DONOR (EVO)

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Cost Element	Unit	PED			EVO		
		Unit Cost	No.	Cost	Unit Cost	No.	Cost
Bench Scale Treatability Study	LS	\$ 20,000	1	\$ 20,000	\$ 20,000	1	\$ 20,000
Monitoring Well Installation	LS	\$ 20,000	1	\$ 20,000	\$ 20,000	1	\$ 20,000
<i>Drilling Subcontractor</i>	<i>well</i>	<i>\$ 2,500</i>	<i>5</i>	<i>\$ 12,500</i>	<i>\$ 2,500</i>	<i>5</i>	<i>\$ 12,500</i>
<i>Well Development</i>	<i>well</i>	<i>\$ 500</i>	<i>5</i>	<i>\$ 2,500</i>	<i>\$ 500</i>	<i>5</i>	<i>\$ 2,500</i>
<i>Oversight</i>	<i>hr</i>	<i>\$ 100</i>	<i>50</i>	<i>\$ 5,000</i>	<i>\$ 100</i>	<i>50</i>	<i>\$ 5,000</i>
Donor Application	Event	\$ 94,750	4	\$ 379,000	\$ 107,687	4	\$ 430,748
<i>Donor</i>	<i>kg</i>	<i>\$ 7.50</i>	<i>620</i>	<i>\$ 4,650</i>	<i>\$ 4.30</i>	<i>4,090</i>	<i>\$ 17,587</i>
<i>Bioaugmentation Culture</i>	<i>L</i>	<i>\$ 255</i>	<i>20</i>	<i>\$ 5,100</i>	<i>\$ 255</i>	<i>20</i>	<i>\$ 5,100</i>
<i>DPT Subcontractor</i>	<i>LS</i>	<i>\$ 75,000</i>	<i>1</i>	<i>\$ 75,000</i>	<i>\$ 75,000</i>	<i>1</i>	<i>\$ 75,000</i>
<i>Oversight</i>	<i>hr</i>	<i>\$ 100</i>	<i>100</i>	<i>\$ 10,000</i>	<i>\$ 100</i>	<i>100</i>	<i>\$ 10,000</i>
Groundwater Monitoring	Event	\$ 9,475	16	\$ 151,600	\$ 9,475	22	\$ 208,450
<i>Analytical</i>	<i>LS</i>	<i>\$ 1,875</i>	<i>1</i>	<i>\$ 1,875</i>	<i>\$ 1,875</i>	<i>1</i>	<i>\$ 1,875</i>
<i>Sampling Equipment</i>	<i>LS</i>	<i>\$ 200</i>	<i>1</i>	<i>\$ 200</i>	<i>\$ 200</i>	<i>1</i>	<i>\$ 200</i>
<i>Sampling Labour</i>	<i>hr</i>	<i>\$ 100</i>	<i>24</i>	<i>\$ 2,400</i>	<i>\$ 100</i>	<i>24</i>	<i>\$ 2,400</i>
<i>Reporting</i>	<i>LS</i>	<i>\$ 5,000</i>	<i>1</i>	<i>\$ 5,000</i>	<i>\$ 5,000</i>	<i>1</i>	<i>\$ 5,000</i>
Total				\$ 570,600			\$ 679,198

Notes:

1. Assuming basis parameters listed in Table 6.
2. Assumes semi-annual groundwater monitoring (for the assumed duration plus one year).

8 IMPLEMENTATION ISSUES

In the DEM/VAL it was confirmed that nBA can be a suitable option for source treatment. The nBA nBA was applied using conventional direct push equipment. No special equipment was required and injection used standard commercial off-the-shelf materials. It should be noted that the PED, n-butyl acetate, is a Class 1B flammable liquid. It is a colorless liquid that volatilizes to form dense vapors which have the potential to form an explosive mixture with air. Handling precautions such as bonding and grounding are required when working with the pure phase nBA. In addition, some plastics, such as those composed of polyvinyl chloride, are known to be attacked by nBA. Care must be taken to ensure that nBA is adequately dissolved if it is applied near PVC wells.

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APPENDIX A
POINTS OF CONTACT

**TABLE A-1
LIST OF CONTACTS**

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Point of Contact	Organization	Phone/Fax/E-mail	Role in Project
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Cory Repta	Geosyntec Consultants 130 Research Lane, Suite 2 Guelph, Ontario, N1G 5G3	(519) 515-0869 Fax: (519) 822-3151 crepta@geosyntec.com	Project Manager
Dr. Kurt Pennell	Department of Civil and Environmental Engineering, Tufts University, 200 College Ave., Medford, MA 02155	(617) 627-3099 Fax (617) 627-3994 kurt.pennell@tufts.edu	Laboratory Technical Director
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Mike Deliz, P.G.	National Aeronautics and Space Administration, Mail Code TA-B1B, Bldg. M6-399, Rm 1641, John F. Kennedy Space Center, FL 32899	(321)867-6971 Fax (321) 867-4446 michael.j.deliz@nasa.gov	NASA Project Manager

APPENDIX B

SYSTEM INSTALLATION AND BASELINE CHARACTERIZATION

APPENDIX B

SYSTEM INSTALLATION AND BASELINE CHARACTERIZATION

B.1 SYSTEM INSTALLATION

The DEM/VAL was conducted in two sweep zones, one above and one below the clay horizon. For each sweep zone, a groundwater recirculation system consisting of a central extraction well and five peripheral injection (recharge) wells was constructed to move groundwater through the PED-amended zone and maintain hydraulic control within the DEM/VAL area (Figure 13 of the main document). The recirculation systems utilized solar-powered submersible pumps. The system components were housed in a mobile trailer, with the solar panels mounted to the roof. To supplement the existing monitoring wells, three multilevel monitoring well bundles were installed within the demonstration area at varying distances from the central extraction location. A schematic cross section of the DEM/VAL plot is provided in Figure 10 (see main document), showing the locations of the well screens relative to the site lithology and the MIP data from the IW0076 location. Figure 14 (see main document) shows the process flow diagram for the groundwater recirculation system.

B.1.1 WELL CONSTRUCTION

Borehole drilling and well installation was performed by a State-licensed driller, Environmental Drilling Services, Inc. (EDS), under the direction of a Geosyntec field geologist. The field geologist maintained a complete record of the design and construction of each well and of all materials installed in the borehole (i.e., length of screen and casing, volume of sand and bentonite pellets, bags of cement, etc.). A total of 30 wells (two central extraction wells, ten paired recharge wells and three multilevel bundle monitoring wells with six depth intervals each) were installed between 17 and 25 January 2011. Table B-1 summarizes the well construction details. Well construction logs are provided as Attachment B-1 to this appendix. The lithology was assessed at the four soil boring locations (see below).

B.1.1.1 Extraction Well Installation

The two extraction wells (RW0007 and RW0008) were installed using hollow stem auger (HSA) techniques on 19 to 21 January 2011. Extraction well RW0007 was screened above the silty clay layer (35 to 42 ft BLS) and extraction well RW0008 was screened below the clay layer (47 to 57 ft BLS). The extraction wells were constructed of 6-inch diameter schedule 40 polyvinylchloride (PVC) risers and factory-slotted screens (0.020-inch slot size), completed in 14-inch diameter boreholes. The annular space around the well screen was filled with 6/20 sand filter pack followed by a 5-ft (minimum) thick bentonite seal. After allowing the bentonite chips to hydrate, the remaining annular space was grouted to surface with cement grout. The extraction wells were completed with an 18-inch x 18-inch steel well vault and 3-ft x 3-ft x

4-inch thick concrete pad. Two stub-outs, one for electrical wiring (1-inch diameter) and one for system piping (2-inch diameter) were installed in the wall of the vault box prior to completion. Construction details for the extraction wells are presented on Figure B-1. The well construction logs are included in Attachment B-1.

B.1.1.2 Injection Well Installation

Five injection well pairs (IJ0013 to IJ0022) were installed using HSA techniques on 17 to 20 January 2011. Each injection well pair consists of one injection well screened above the clay layer (32 to 42 ft BLS) and one injection well screened below the clay layer (47 to 57 ft BLS), completed in the same 10-inch diameter borehole. Injection wells were constructed of 2-inch diameter schedule 40 PVC with 0.020-inch slotted screen. The annular space around the well screens was filled with a 6/20 sand filter pack, extending 1-ft (minimum) above the screen interval, followed by a 2-ft (minimum) bentonite seal. Once the lower well was in place with its filter pack and bentonite seal, the upper well was installed in the borehole with its filter pack and seal. After allowing the bentonite chips to hydrate, the remaining annular space was grouted to surface with cement grout. The injection well pairs were completed at surface with an 18-inch x 18-inch steel well vault and 3-ft x 3-ft x 4-inch thick pad. Construction details of the injection wells are presented on Figure B-2. The well construction logs are included in Attachment B-1.

B.1.1.3 Bundle Monitoring Well Installation

Three bundle monitoring wells (BW0001A-F, BW0002A-F, and BW0003A-F) were installed using DPT on 20 to 24 January 2011. Each bundle well includes six individual monitoring wells with the following screen intervals: 23 to 26, 30 to 33, 37 to 40, 44 to 47, 51 to 54, and 58 to 61 ft BLS. The wells were constructed of ¾-inch schedule 40 PVC and screens with pre-packed filter packs consisting of 0.010-inch slotted screens surrounded with 20/30 filter sand. For wells A, B and C, 2 ft of 30/45 silica sand was placed as a seal above the pre-packed filter and the remainder of the hole was grouted to surface. For well D, a 2 ft bentonite sleeve was placed above the pre-packed filter and the remainder of the hole was grouted to surface. For wells E and F, two bentonite sleeves (4 ft total length) were placed 2.5 ft and 10 ft, respectively, above the pre-packed filter followed by grout to surface. The positions of the bentonite sleeves on wells E and F were selected to ensure a competent seal within the confining unit located at approximately 44 to 48 ft BLS. Annular space in between the pre-packed filter and the bentonite seal was allowed to fill with collapsed native material. Each bundle monitoring well was completed with a 4-ft x 6-ft x 4-inch thick concrete pad that contained the six individual monitoring wells (A through F), each with a separate 8-inch diameter steel cover. Construction details for the bundle wells are presented on Figure B-3. The well construction logs are included in Attachment B-1.

B.1.2 WELL DEVELOPMENT

Following installation, the newly installed wells were developed using standard surging and purging methods. The extraction wells were pumped with a centrifugal pump at rates up to 7 gallons per minute (gpm), with periodic stops to allow the well to recharge, until the turbidity had decreased and stabilized. A volume of 85 to 100 gal was removed from each extraction well. The injection wells were developed using a submersible pump, at rates of 1 to 2 gpm, to remove 20 to 30 gal from each until the water produced was clear of sediment. The bundle monitoring wells were developed with a peristaltic pump at an average rate of 0.15 gpm, removing approximately 5 gal from each. Development was continued until field parameters including turbidity had stabilized. Well development data for the bundle wells is included in Appendix C (Attachment C-2 Field Forms).

B.1.3 GROUNDWATER RECIRCULATION SYSTEM

The groundwater recirculation system was installed in March 2011. It consisted of a mobile utility trailer that housed the system components and piping that carried the flow of groundwater from the extraction wells to the trailer and then to the injection wells. Parallel independent groundwater recirculation systems were operated for each of the upper and lower sweep zones.

B.1.3.1 Solar Powered Recirculation System

The groundwater recirculation systems operated using solar power. For each sweep zone, groundwater is pumped from the central extraction well and delivered to the five perimeter injection wells. Groundwater was pumped from each extraction well using a 4.25-inch diameter submersible pump (Robison BL40Q). Each pump was powered by two 12 volt (V) deep-cycle marine batteries that are charged by two 85 Watt (W) solar panels (27-inch by 42-inch) mounted to the top of the 5-ft by 8-ft mobile utility trailer that houses all the recirculation system components. Other components housed in the trailer include charge controllers, timers, hour meters, sediment filters, sample ports, flow totalizers, a piping manifold, and individual flow meters for the ten injection wells. A process and instrumentation diagram (P&ID) is presented on Figure 14 (see main document).

When powered, the pumps provided a flow rate of approximately 2.5 gpm. Each pump circuit included a timer that was set to operate the system for 40 minutes of each hour. This timing cycle extended the effective time that the systems were active, in effect distributing the downtime throughout the day. This approach was selected because the solar panels could not always collect sufficient energy to fully recharge the batteries, resulting in periods of no pumping. The systems often experienced periods of complete shutdown overnight, depending on the weather. Occasionally a recirculation loop would be down for a longer period due to actual pump failures.

B.1.3.2 Recirculation System Piping

The recirculation piping system was constructed using 0.75-inch diameter polyethylene (PE) tubing. The lines were run above-ground, enclosed in 2-inch diameter schedule 40 PVC for secondary containment. The upper and lower sweep zones had independent recirculation systems, with no mixing of fluid from one zone to the other. The PE tubing was connected directly to the submersible pumps and exited the extraction vault boxes through the stub-out to run from the extraction well to the system trailer. Within the trailer, extracted groundwater passed through a filter assembly (20 micron), a totalizing flowmeter, and a flow-controlling globe valve before entering a distribution header. Each extraction line was equipped with a sample port to facilitate sample collection. Each of the two headers consisted of five parallel discharge lines, each equipped with a flow-control valve and rotameter allowing flow to be divided and balanced between the five injection wells in each sweep zone. The ten individual lines to the injection well pairs were similarly run within PVC for secondary containment, entering the injection vault boxes through the stub-out. Each injection line was extended into the injection well to act as a drop tube, so that returning groundwater was released approximately 2 feet below the static groundwater elevation.

B.1.3.3 Pressure Transducers

Submersible pressure transducers and data loggers (Solinst Leveloggers™) were deployed in the extraction wells (RW0007 and RW0008), six injection wells (IJ0013, IJ0014, IJ0017, IJ0018, IJ0019, and IJ0020) and two monitoring wells (IW0002D and IW0002D1) to measure and record water level fluctuations during system operation. The data loggers were programmed to record pressure readings every 15 minutes. The data loggers were deployed part way through the Baseline Flux Assessment phase, on 23 March 2011. After the Baseline Flux phase, the loggers were removed for PED Injection and re-deployed in eight locations (IJ0013, IJ0014, IJ0017, IJ0018, IW0002D, IW0002D1, RW0007 and RW0008) prior to initiation of the Main Recirculation Phase. The data was periodically downloaded during system maintenance visits. All data loggers were removed, except from the two extraction wells, on 05 April 2012 (week 35, except for the logger in IJ0013, which stopped at week 26). The data loggers in both extraction wells remained operational until the recirculation system was shut down on 11 September 2012.

B.1.3.4 Granular Activated Carbon

During the initial groundwater recirculation phase to establish baseline concentrations and mass flux (Task 3), extracted groundwater was treated with granular activated carbon (GAC) prior to re-injection. The GAC vessels were plumbed into the system so that extracted groundwater was treated before it entered the trailer and the flow was divided (Figure 14; see main document).

B.2 BASELINE CHARACTERIZATION

Baseline characterization involved collection of soil and groundwater samples within the test plot. Soil samples were collected during well installation activities. Groundwater sampling included an initial synoptic event (Task 2) to characterize VOC distributions within the test plot following well construction, and subsequent routine sampling of the extraction wells and selected monitoring locations during groundwater recirculation to establish the baseline flux of VOCs (Task 3). Task 3 included a synoptic event to determine the VOC distribution at the end of the Baseline Flux Assessment Phase. These activities are further described below.

Sampling activities, including field measurements, sample collection, decontamination, and documentation were performed in accordance with FDEP Standard Operating Procedures (SOPs) for Field Activities (DEP-SOP-001/01) dated March 31, 2008 (effective December 3, 2008) (FDEP, 2008) and the NASA Sampling and Analysis Plan (NASA, 2006).

B.2.1 SOIL SAMPLING

Prior to well installation, four soil cores (SB1001 through SB1004) were collected using direct push technology (DPT) techniques at locations corresponding to bundle wells BW0001, BW0002, and BW0003 and using hollow-stem auger with split spoons at extraction well RW0008 on 19 January 2011. The locations are shown in Figure 13 (see main report). At each soil boring location, to a depth of approximately 60 ft BLS, continuous-core soil samples were collected, examined and logged to confirm the local distribution of lithologic units and the depth and thickness of the silty clay horizon. Boring logs are provided with the field forms in Appendix C (Attachment C-2). The cores were screened in the field using a hand-held photoionization detector (PID) to assess where samples might be expected to contain high concentrations of VOCs and/or residual DNAPL. Nineteen subsamples (four to six samples from each location) were selected for laboratory analysis in the mobile lab (KB Labs) by EPA method 5035/8260. In addition, eight samples were collected for laboratory determination of the fraction of organic carbon (f_{oc}) and four samples for grain size distribution. Samples were also collected and archived for potential microbial characterization (*Dehalococcoides* [*Dhc*] and/or vinyl chloride reductase [*vcrA*] assay), although these samples were not analysed.

Results from the sampling event are compiled and presented in Table E-1-1 in Attachment E-1 in Appendix E. Laboratory results from this sampling event are provided in Appendix G.

Soil investigation derived waste (IDW) was contained in properly labeled 55-gallon drums which were stored on NASA provided spill pallets.

B.2.2 HYDRAULIC TESTING

Following well installation and development, on 15 February 2011, hydraulic testing of the extraction wells and four recharge wells was performed using a pneumatic slug test technique,

which used air pressure to disturb the static water level in the well while measuring and recording the response with a pressure transducer. The time-recovery data was then analyzed to assess the transmissivity of the formation at that well. The data was analyzed to obtain estimates of the hydraulic conductivity using the Hvorslev Method. Calculation sheets for these estimates are included in Attachment B-2.

B.2.3 GROUNDWATER SAMPLING

B.2.3.1 Initial Baseline

Baseline groundwater sampling was conducted to confirm VOC delineation and to establish pre-DEM/VAL conditions within, and in the vicinity of the Hot Spot 1 treatment zone. Baseline characterization comprised a synoptic survey (Task 2) of initial VOC concentrations following installation and development of the new wells in the test plots, followed by an assessment of VOC concentrations and distribution during groundwater extraction and recirculation (Task 3), including a second synoptic survey at the end of this baseline recirculation.

Two pre-existing monitoring wells within Hot Spot 1 are screened above and below the target treatment zone; however, the upper monitoring well (IW0002S) could not be located and was believed to have been destroyed. Additional far-field perimeter monitoring well pairs are arranged in a triangular pattern around Hot Spot 1, located at distances of 160 ft to 240 ft from the center of the area (refer to Figure 13). These outlying monitoring well clusters provided monitoring locations to document that the PED DEM/VAL did not have a negative effect on surrounding groundwater conditions; these locations were included in the sampling program to demonstrate Underground Injection Control (UIC) permit compliance. The Groundwater Cleanup Target Level (GCTL) for n-butyl acetate is 43 µg/L.

The baseline synoptic survey of initial VOC concentrations (Task 2), conducted on 1 to 3 February 2011, included the collection of groundwater samples for field parameters, including depth to water, and VOCs from a total of 34 locations (refer to Table 2) comprising all bundle monitoring wells (BW0001A-F, BW0002A-F and BW0003A-F), four existing site monitoring wells (IW0002I, IW0002D, IW0002D1 and IW0076), four of the ten injection wells (IJ0015, IJ0016, IJ0019 and IJ0020), the two extraction wells (RW0007 and RW0008), and the six perimeter monitoring wells (IW0067D, IW0067D1, IW0070D, IW0070D1, IW0071D and IW0071D1). The sample collection table for the event is included in Appendix D and the samples collected are summarized in Table 2 of the main document.

Results from this Initial Baseline sampling event are compiled and presented in Tables E-1-5 (VOCs) and E-1-9 (Field Geochemical Parameters) in Attachment E-1 in Appendix E. The VOC data is included in Figures 3 and 4 for the extraction wells and the corresponding figures in Appendix E for other monitoring locations. The results were incorporated into the interpolated TCE distribution presented in Figure 16 (main document). The laboratory reports from this sampling event are provided in Appendix G.

B.2.3.2 Baseline Flux Assessment

Further characterization of baseline groundwater conditions was conducted during the Baseline Flux Assessment Phase (Task 3). This involved continuous groundwater extraction for a period of about 4 weeks, with routine weekly sampling of the extraction wells (RW0007 and RW0008) and select monitoring wells (BW0001C, BW0002C, BW0003C, IW0002I, and IW0002D in the upper zone; and BW0001E, BW0003E, and IW000D1 in the lower zone) to establish the baseline VOC profile and flux under pumping conditions in both the upper and lower sweep zones of the test plot. The Baseline Flux Assessment was conducted from 14 March 2011 through 18 April 2011. Groundwater samples were collected weekly for analysis for VOCs, nBA, and nBuOH. The samples from the extraction wells were also analyzed weekly for VFAs, tracers (bromide and iodide) and TOC, and biweekly for sulfide, DHGs, anions and alkalinity. The sampling program is provided in Appendix D. Details about the operation of the recirculation system during the Baseline Flux Assessment are provided in Appendix C.

At the end of this baseline flux assessment phase, a comprehensive synoptic groundwater sampling event was conducted. During this sampling event, the extraction wells, bundle monitoring wells and existing site monitoring wells (including the far-field monitoring wells surrounding the treatment area) were sampled (30 locations total) and analyzed for the following parameters (as listed in Table 2):

- Field parameters (DO, ORP, pH, specific conductivity, temperature, turbidity);
- VOCs (including nBA, nBuOH, TCE and related breakdown products);
- VFAs (including formate, acetate, lactate, propionate and butyrate);
- Tracers (bromide and iodide);
- TOC;
- DHGs (including methane, ethane, ethene);
- Anions (chloride, nitrate, nitrite, sulfate);
- Dissolved metals (iron, manganese and arsenic);
- Sulfide;
- Alkalinity; and
- Microbial characterization (*Dhc* and/or *vcrA*).

Details of the sampling program are provided in Appendix D and the samples collected are summarized in Table 2 of the main document.

Results from the Baseline Flux Assessment Phase sampling events are compiled and presented in Tables E-1-5 (VOCs), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-8 (Dissolved Metals), E-1-9 (Field Geochemical Parameters) and E-1-10 (*Dhc* and *vcrA*) in

Attachment E-1 in Appendix E. The VOC data is plotted in Figures 1, 3, 4, and 20 and in the corresponding time-trend and VOC distribution plots included in Appendix E. The laboratory reports from these sampling events are provided in Appendix G.

B.2.3.2.1 GAC Treatment

During the Baseline Flux Assessment phase, extracted groundwater was treated with granular activated carbon (GAC) to remove VOCs so that no VOCs were re-injected on the perimeter of the test plots. Samples of the GAC effluent were collected periodically (weeks 2, 3 and 4), from sampling ports located inside the system trailer, to confirm the efficacy of treatment. The samples were analyzed for VOCs by EPA Method 8260C. The results, which are presented in Table B-2, confirmed that the GAC removed the VOCs.

B.2.4 INVESTIGATION-DERIVED WASTE (IDW)

Investigation-derived waste (IDW) collected during the installation activities consisted of soils and liquids generated during drilling/coring, well purging and equipment cleaning. All IDW was characterized and disposed of in accordance with NASA standard site protocols.

Soil IDW was collected in a 20-yard roll-off bin. A composite soil sample was then collected and analyzed for VOCs (EPA Method 8260C) and metals (EPA Method 6010C and 7471B), as well as leachable VOCs using the toxicity characteristic leaching procedure (TCLP; EPA Method 1311). Soil IDW (12.65 tons) was transported to the Omni Waste of Osceola County Landfill by Florida Environmental Compliance Corporation (FECC) for disposal as non-hazardous waste. Laboratory analytical results are provided in Appendix G and the non-hazardous waste manifest is included in Attachment B-3 to this appendix.

Liquid IDW was collected in properly labeled 55-gallon drums and stored on NASA-provided spill pallets secured with cargo straps. A liquid sample was collected from each drum and submitted for analysis for VOCs (EPA Method 8260C), the laboratory results were provided to NASA, and drums were disposed of by NASA.

B.3 ATTACHMENTS

Table B-1	Well Construction Details
Table B-2	Summary of Effluent from Granular Activated Carbon Treatment
Figure B-1	Extraction Well Construction Details
Figure B-2	Injection Well Construction Details
Figure B-3	Bundle Monitoring Well Construction Details
Attachment B-1	Well Construction Logs
Attachment B-2	Hydraulic Conductivity Test Results
Attachment B-3	IDW Waste Manifest

TABLE B-1. WELL CONSTRUCTION DETAILS
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Coordinates		Borehole Diameter (inches)	Casing Diameter (inches)	Total Well Depth (ft BLS)	Top of Screen (ft BLS)	Bottom of Screen (ft BLS)	Sand Pack Interval (ft BLS)	Seal Interval (ft BLS)	Grout Interval (ft BLS)	Top of Casing Elevation (ft BLS)	Surface Completion Type	Well Completion Date	Drilling Method	Well Type
	Easting (m)	Northing (m)													
LC34-BW0001A	242878.400	463707.029	2.25	0.75	26.00	23.00	26.00	23 to 26	21 to 23	0.6 to 23	NS	Flush	01/20/2011	DPT	BW
LC34-BW0001B	242878.400	463707.029	2.25	0.75	33.00	30.00	33.00	30 to 33	28 to 30	0.6 to 28	NS	Flush	01/20/2011	DPT	BW
LC34-BW0001C	242878.400	463707.029	2.25	0.75	40.00	37.00	40.00	37 to 40	35 to 37	0.6 to 35	NS	Flush	01/20/2011	DPT	BW
LC34-BW0001D	242878.400	463707.029	2.25	0.75	47.00	44.00	47.00	44 to 47	42 to 44	0.6 to 42	NS	Flush	01/20/2011	DPT	BW
LC34-BW0001E	242878.400	463707.029	2.25	0.75	54.00	51.00	54.00	51 to 54	44.5 to 48.5	0.6 to 44.5	NS	Flush	01/24/2011	DPT	BW
LC34-BW0001F	242878.400	463707.029	2.25	0.75	61.00	58.00	61.00	58 to 61	44 to 48	0.6 to 44	NS	Flush	01/20/2011	DPT	BW
LC34-BW0002A	242883.959	463705.969	2.25	0.75	26.00	23.00	26.00	23 to 26	21 to 23	0.6 to 21	NS	Flush	01/20/2011	DPT	BW
LC34-BW0002B	242883.959	463705.969	2.25	0.75	33.00	30.00	33.00	30 to 33	28 to 30	0.6 to 28	NS	Flush	01/21/2011	DPT	BW
LC34-BW0002C	242883.959	463705.969	2.25	0.75	40.00	37.00	40.00	37 to 40	35 to 37	0.6 to 35	NS	Flush	01/21/2011	DPT	BW
LC34-BW0002D	242883.959	463705.969	2.25	0.75	47.00	44.00	47.00	44 to 47	42 to 44	0.6 to 42	NS	Flush	01/21/2011	DPT	BW
LC34-BW0002E	242883.959	463705.969	2.25	0.75	54.00	51.00	54.00	51 to 54	44.5 to 48.5	0.6 to 44.5	NS	Flush	01/24/2011	DPT	BW
LC34-BW0002F	242883.959	463705.969	2.25	0.75	61.00	58.00	61.00	58 to 61	44 to 48	0.6 to 44	NS	Flush	01/21/2011	DPT	BW
LC34-BW0003A	242879.536	463703.464	2.25	0.75	26.00	23.00	26.00	23 to 26	21 to 23	0.6 to 21	NS	Flush	01/21/2011	DPT	BW
LC34-BW0003B	242879.536	463703.464	2.25	0.75	33.00	30.00	33.00	30 to 33	28 to 30	0.6 to 28	NS	Flush	01/24/2011	DPT	BW
LC34-BW0003C	242879.536	463703.464	2.25	0.75	40.00	37.00	40.00	37 to 40	35 to 37	0.6 to 35	NS	Flush	01/24/2011	DPT	BW
LC34-BW0003D	242879.536	463703.464	2.25	0.75	47.00	44.00	47.00	44 to 47	42 to 44	0.6 to 42	NS	Flush	01/21/2011	DPT	BW
LC34-BW0003E	242879.536	463703.464	2.25	0.75	54.00	51.00	54.00	51 to 54	44.5 to 48.5	0.6 to 44.5	NS	Flush	01/24/2011	DPT	BW
LC34-BW0003F	242879.536	463703.464	2.25	0.75	61.00	58.00	61.00	58 to 61	44 to 48	0.6 to 44	NS	Flush	01/21/2011	DPT	BW
LC34-IJ0013	242885.921	463715.105	10.00	2.00	42.15	32.25	41.75	31 to 42.15	27 to 31	1 to 27	NS	Flush	01/20/2011	HSA	INJ
LC34-IJ0014	242885.921	463715.105	10.00	2.00	57.15	47.25	56.75	46 to 57.15	43 to 46	1 to 43	NS	Flush	01/20/2011	HSA	INJ
LC34-IJ0015	242892.511	463701.804	10.00	2.00	42.15	32.25	41.75	31 to 42.15	27.5 to 31	1 to 27.5	NS	Flush	01/20/2011	HSA	INJ
LC34-IJ0016	242892.511	463701.804	10.00	2.00	57.15	47.25	56.75	45.5 to 57.15	42.5 to 45.5	1 to 42.5	NS	Flush	01/20/2011	HSA	INJ
LC34-IJ0017	242881.402	463695.394	10.00	2.00	42.15	32.25	41.75	30.5 to 42.15	28.5 to 30.5	1 to 28.5	NS	Flush	01/18/2011	HSA	INJ
LC34-IJ0018	242881.402	463695.394	10.00	2.00	57.15	47.25	56.75	45.5 to 57.15	43.5 to 45.5	1 to 43.5	NS	Flush	01/18/2011	HSA	INJ
LC34-IJ0019	242868.942	463704.397	10.00	2.00	42.15	32.25	41.75	31 to 42.15	28.5 to 31	1 to 28.5	NS	Flush	01/18/2011	HSA	INJ
LC34-IJ0020	242868.942	463704.397	10.00	2.00	57.15	47.25	56.75	45.5 to 57.15	42 to 45.5	1 to 42	NS	Flush	01/18/2011	HSA	INJ
LC34-IJ0021	242871.529	463716.485	10.00	2.00	42.15	32.25	41.75	31 to 42.15	29 to 31	1 to 29	NS	Flush	01/18/2011	HSA	INJ
LC34-IJ0022	242871.529	463716.485	10.00	2.00	57.15	47.25	56.75	45 to 57.15	43 to 45	1 to 43	NS	Flush	01/17/2011	HSA	INJ
LC34-RW0007	242881.598	463704.927	14.00	6.00	42.00	35.25	41.85	35 to 42	30 to 35	1 to 30	NS	Flush	01/21/2011	HSA	RW
LC34-RW0008	242880.606	463704.376	14.00	6.00	57.50	47.50	57.00	47 to 57.5	39 to 47	1 to 39	NS	Flush	01/19/2011	HSA	RW
LC34-IW0002S [†]	242879.515	463708.971	10.00	2.00	12.00	2.00	12.00	1.5 to 12	1.0 to 1.5	UND	NS	Flush	02/12/1998	HSA	MW
LC34-IW0002I	242880.683	463708.048	8.50	2.00	30.00	25.00	30.00	23 to 30	22 to 23	UND	NS	Flush	05/22/1997	HSA	MW
LC34-IW0002D	242882.024	463707.149	8.50	2.00	40.00	35.00	40.00	33 to 40	32 to 33	UND	NS	Flush	05/22/1997	HSA	MW
LC34-IW0002D1	242883.322	463706.231	8.50	2.00	55.00	50.00	55.00	48 to 55	47 to 48	UND	NS	Flush	05/22/1997	HSA	MW
LC34-IW0067D	242828.013	463736.855	2.125	0.75	43.00	38.00	43.00	38 to 43	NA	0.25 to 38	NS	Flush	05/16/2005	DPT	MW
LC34-IW0067D1	242827.358	463732.478	2.125	1.00	73.67	63.17	73.50	63.67 to 73.67	61.17 to 63.67	0.25 to 61.17	NS	Flush	11/10/2004	DPT	MW
LC34-IW0070D	242939.759	463752.665	2.125	0.75	43.00	38.00	43.00	38 to 43	NA	*	NS	Flush	05/16/2005	DPT	MW
LC34-IW0070D1	242941.250	463753.320	2.125	0.75	75.00	65.00	75.00	65 to 75	60 to 65	0.08 to 60	NS	Flush	06/27/2005	DPT	MW
LC34-IW0071D	242909.630	463669.277	2.125	0.75	43.00	38.00	43.00	38 to 43	33 to 38	0.08 to 33	NS	Flush	06/28/2005	DPT	MW
LC34-IW0071D1	242910.236	463667.817	2.125	0.75	75.00	65.00	75.00	65 to 75	60 to 65	0.08 to 60	NS	Flush	06/28/2005	DPT	MW
LC34-IW0076	242880.725	463706.657	6.00	2.00	80.00	70.00	80.00	67 to 80	65 to 67	0.5 to 65	NS	Flush	07/16/2009	Sonic	MW

Notes:

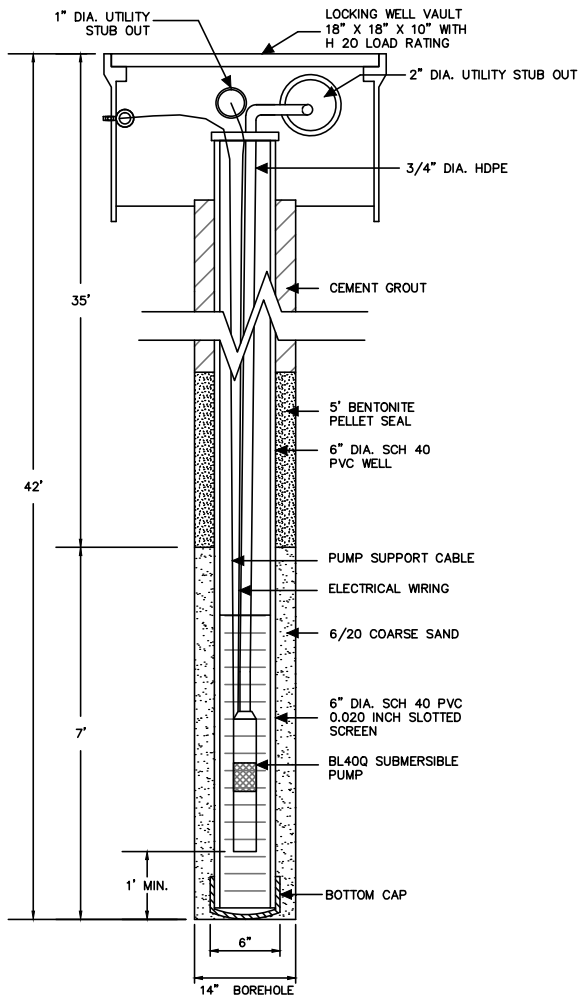
1. Northing and easting are referenced to the Florida State Plane Coordinate System, East Zone North American Datum of 1983.
2. Screen slot size is equal to 0.010 inches for all wells, except RW wells where slot size is 0.020 inches.
3. ft BLS indicates feet below land surface.
4. BW indicates bundle well.
5. DPT indicates direct push technology.
6. HSA indicates hollow stem auger.
7. INJ indicates injection well.
8. MW indicates monitoring well.
9. m indicates meters.
10. NS indicates not surveyed.
11. NA indicates not applicable.
12. RW indicates extraction (recovery) well.
13. UND indicates undetermined.
14. * indicates natural ground collapse.
15. † Grey shading indicates well was lost and presumed destroyed.

**Table B-2. Summary of Effluent from Granular Activated Carbon Treatment
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

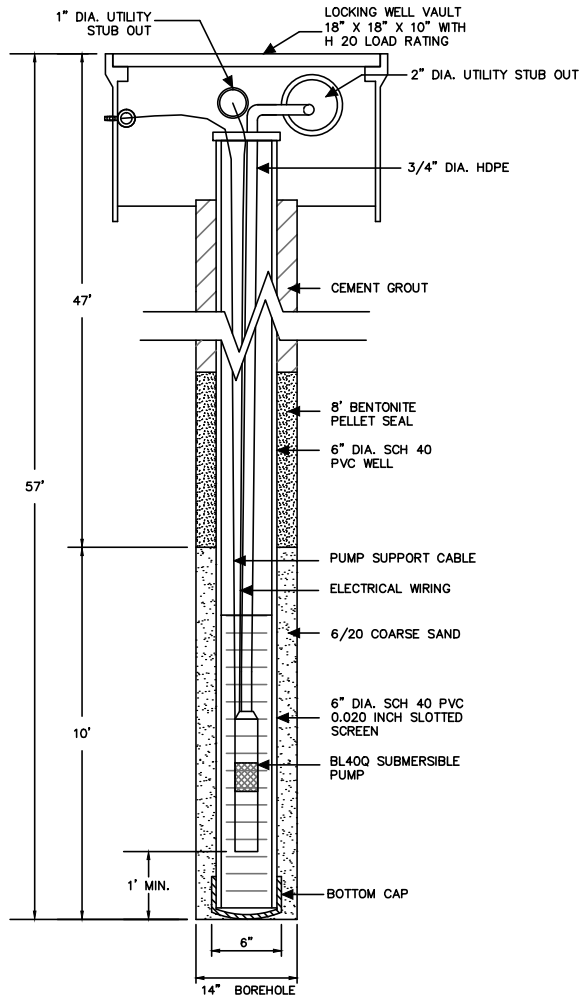
Location	Sample Date	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
GAC Effluent	04/01/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.61 I
	04/01/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U
	04/07/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.6 I
	04/07/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U
	04/18/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U
	04/18/2011	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U

Notes:

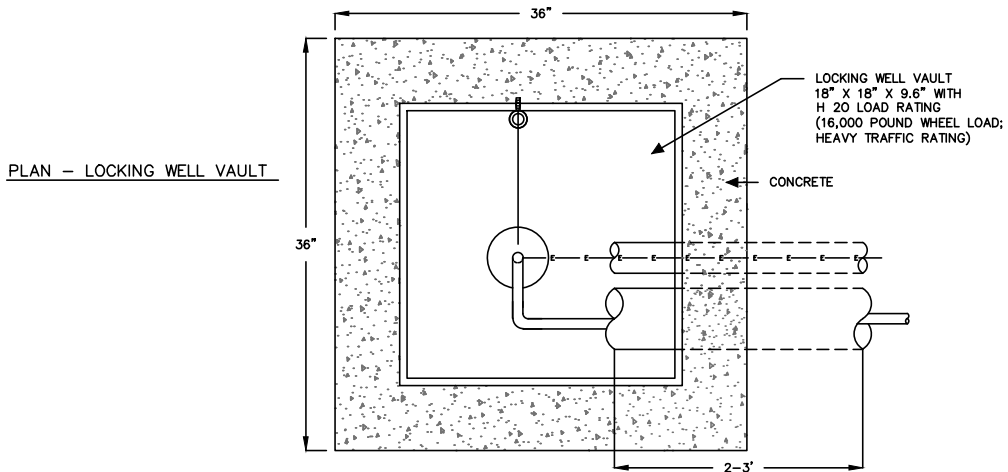
1. µg/L indicates micrograms per liter.
2. I indicates the result is between the method detection limit (MDL) and the practical quantitation limit.
3. U indicates result not detected above MDL.
4. Results not displayed to a set number of significant digits.



EXTRACTION WELL RW0007



EXTRACTION WELL RW0008



PLAN - LOCKING WELL VAULT

Extraction Well Construction Details

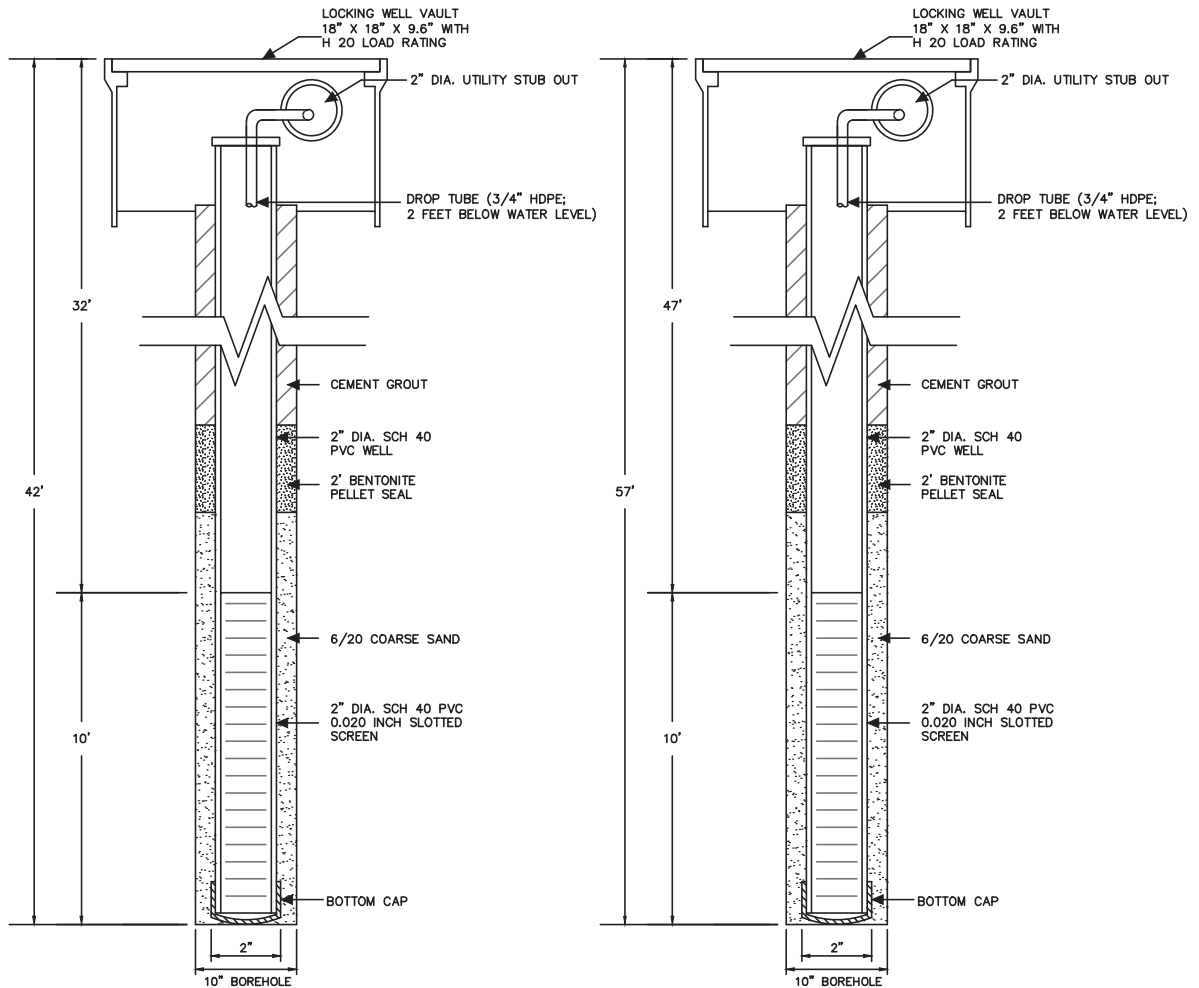
Hot Spot 1, LC34 Cape Canaveral, FL
ESTCP Project ER-0716



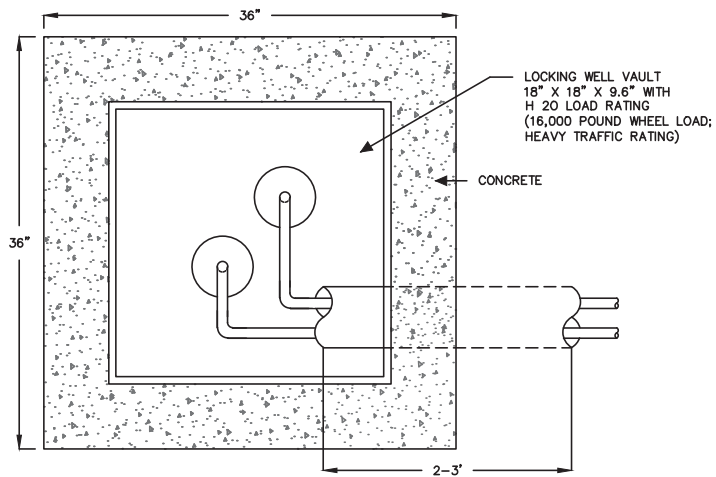
Figure
B-1

Guelph

October 2013



PLAN - LOCKING WELL VAULT



Injection Well Construction Details

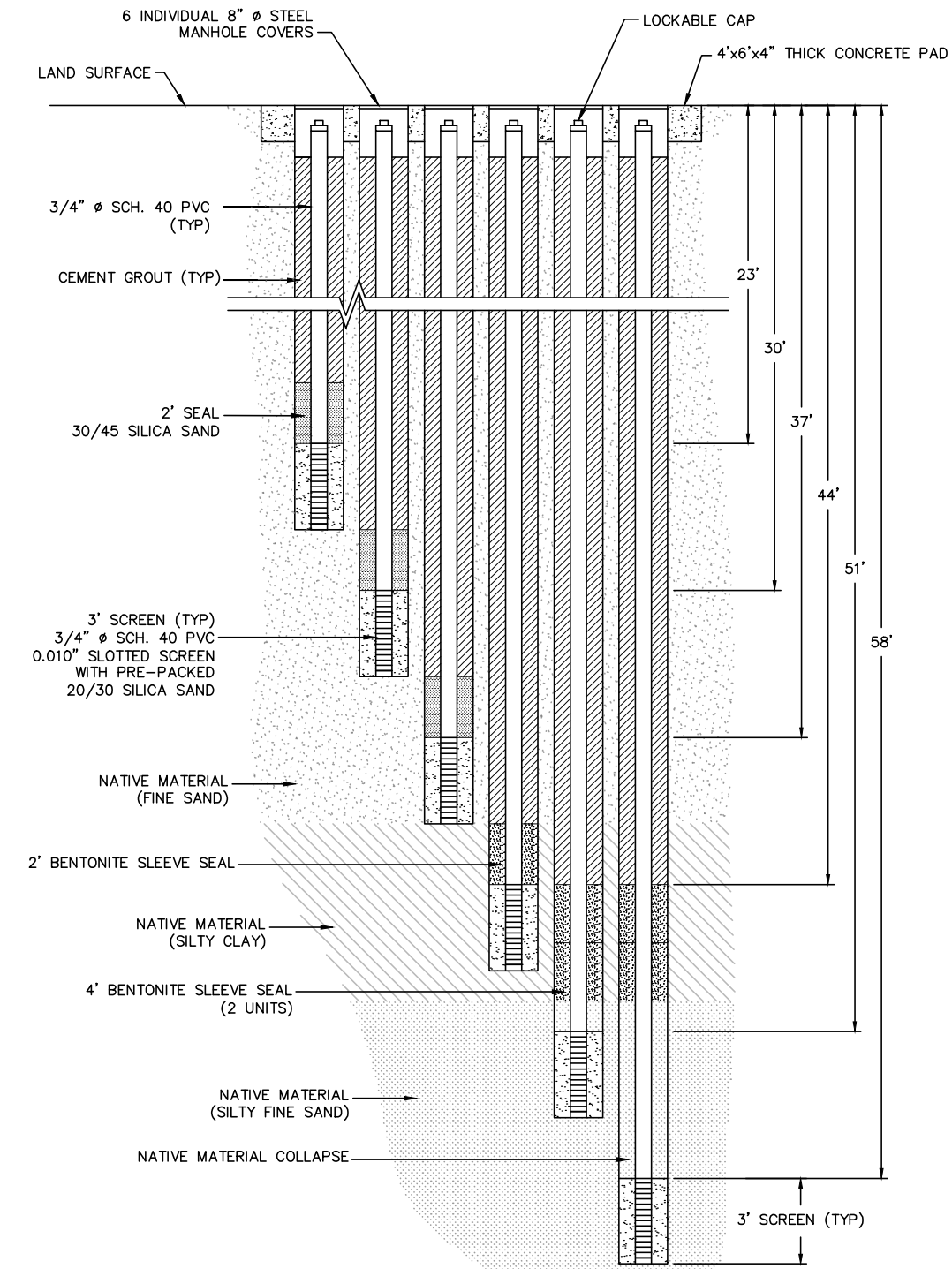
Hot Spot 1, LC34 Cape Canaveral, FL
ESTCP Project ER-0716



Figure
B-2

Guelph

October 2013



BUNDLE MONITORING WELLS
 BW0001A-F, BW0002A-F, AND BW0003A-F

SCREENED INTERVAL (FT BLS)	
A	23 - 26
B	30 - 33
C	37 - 40
D	44 - 47
E	51 - 54
F	58 - 61

Bundle Monitoring Well Construction Details

Hot Spot 1, LC34 Cape Canaveral, FL
 ESTCP Project ER-0716



Figure
 B-3

Guelph

October 2013

ATTACHMENT B-1
WELL CONSTRUCTION LOGS

**WELL CONSTRUCTION LOG
STANDARD FLUSH MOUNT**

Well I.D.: LC34 – BW0001A

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

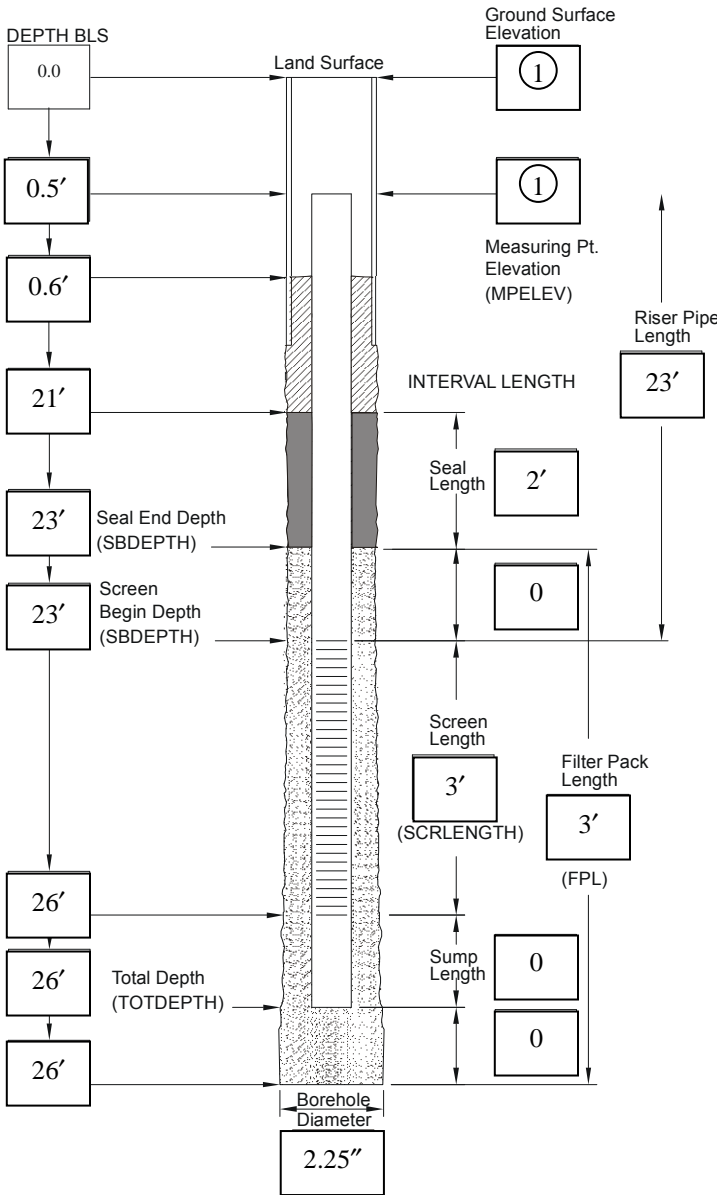
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0001B

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

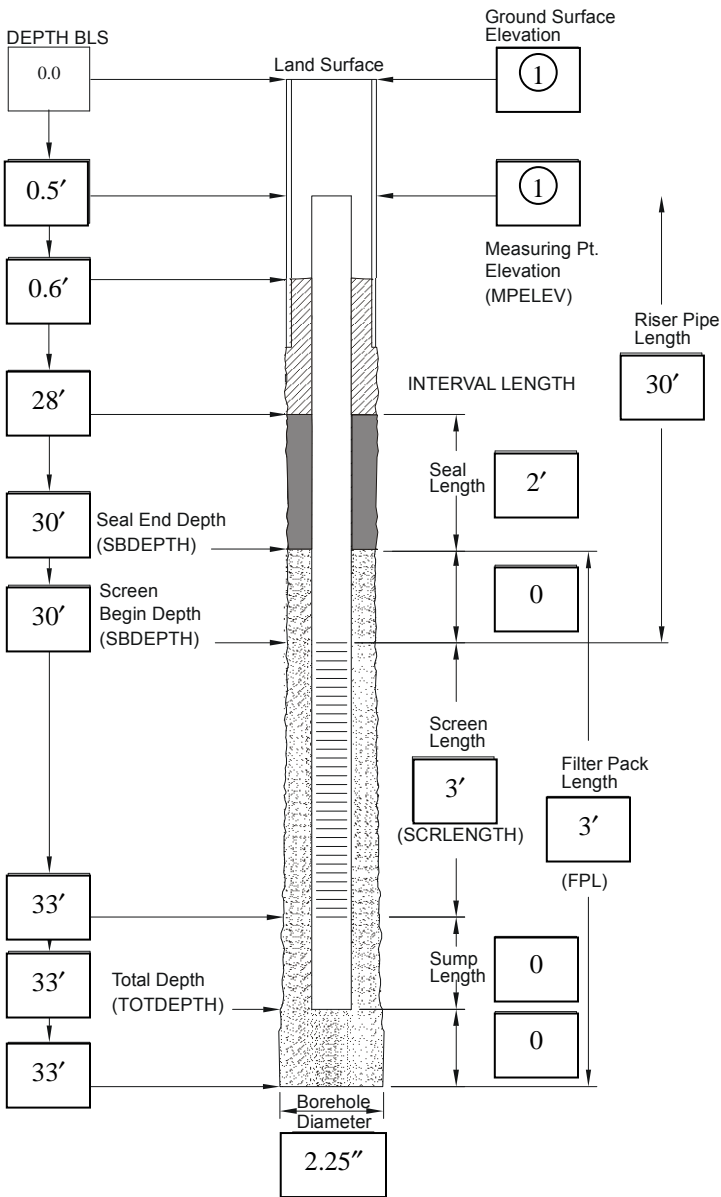
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 7.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0001C

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

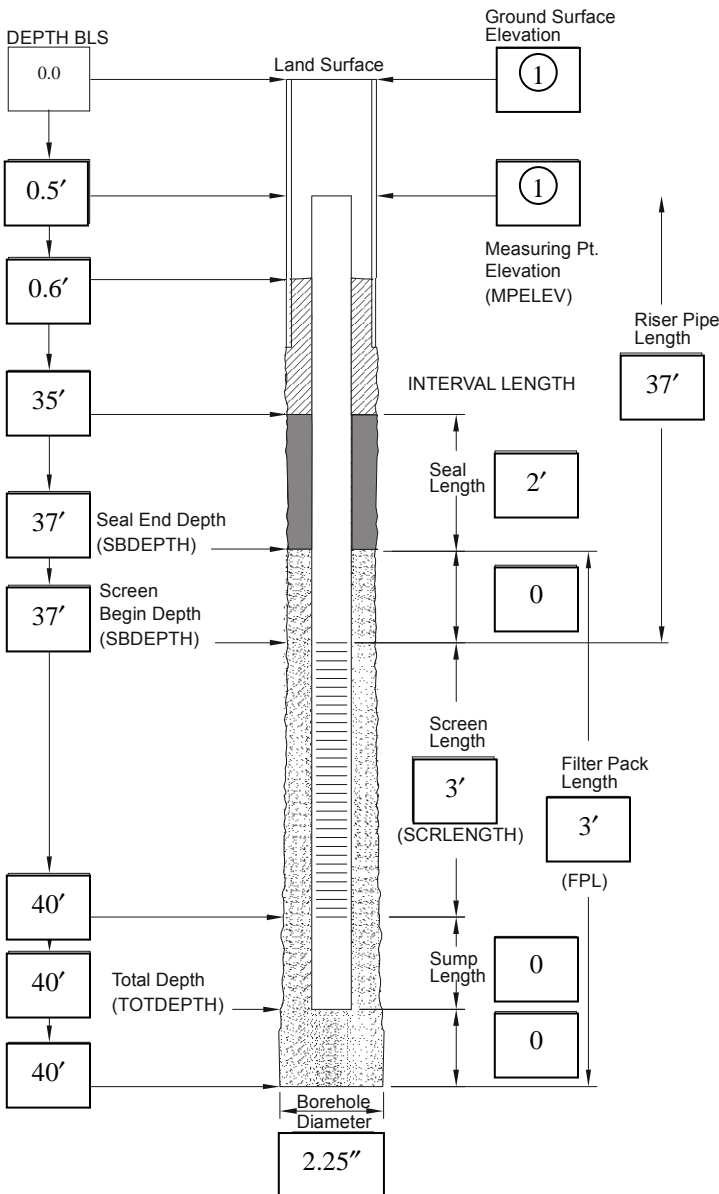
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0001D

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

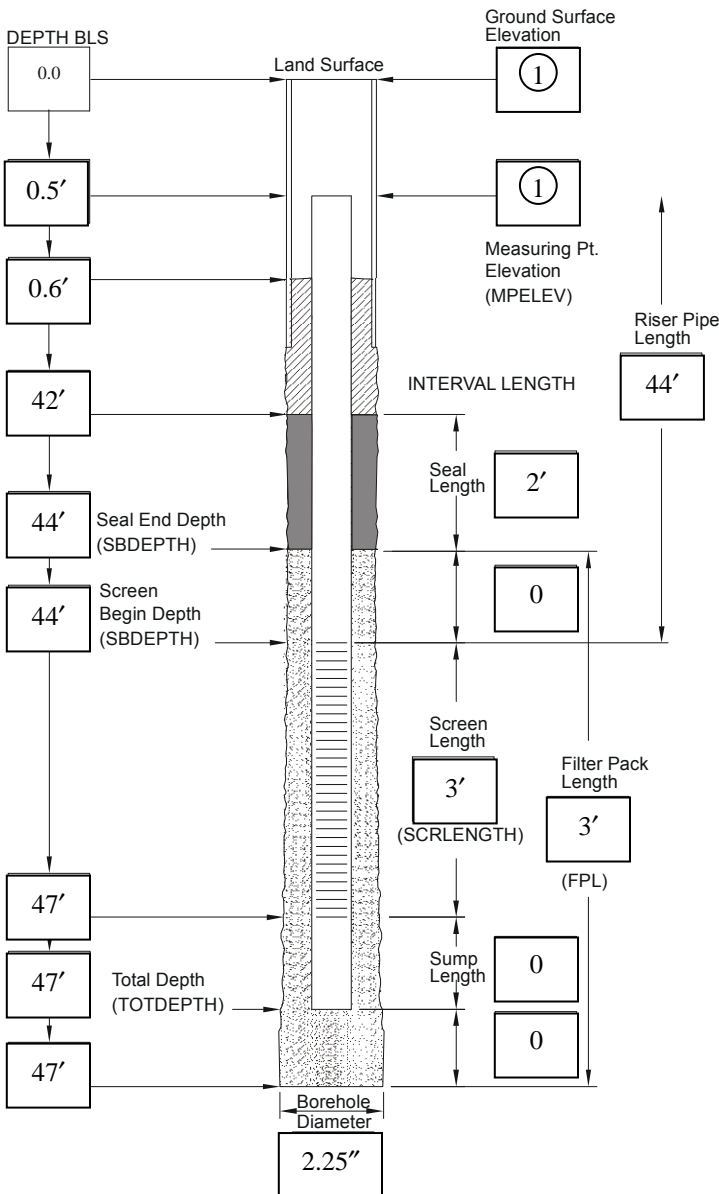
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 6

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0001E

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

Casing Installation Date: 1/24/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial

Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/24/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

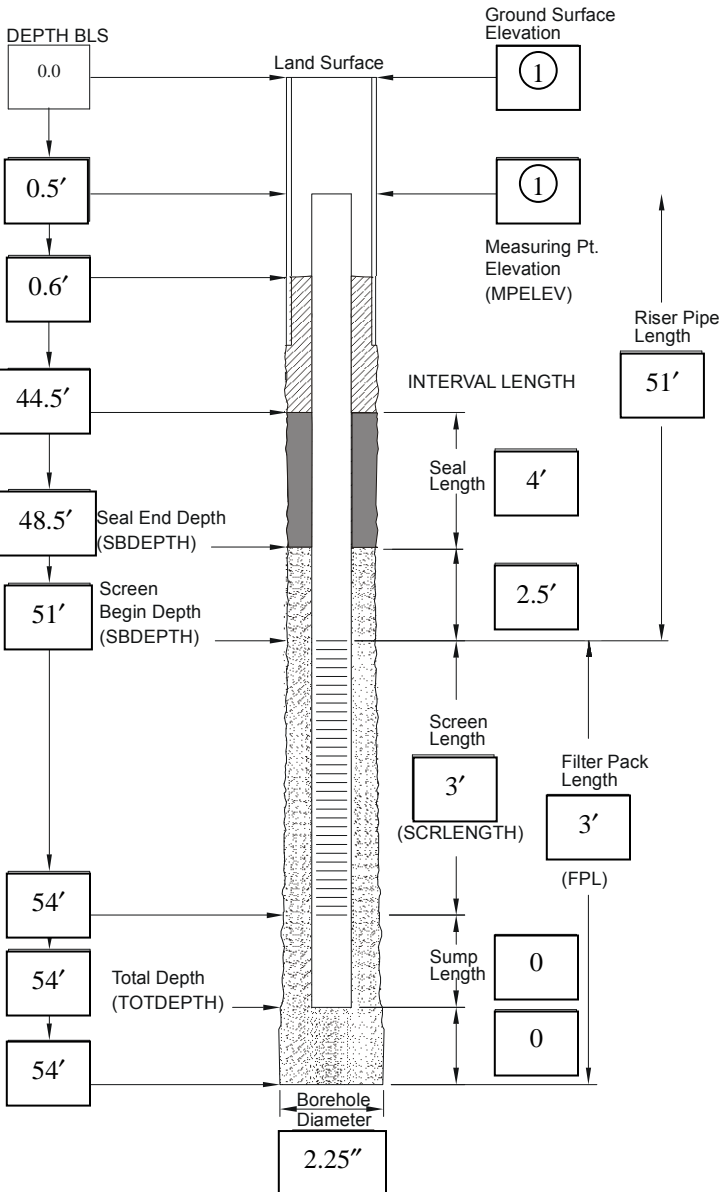
Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 5

Reviewed

By: *[Signature]* Date: 2/1/11



Comments

① Not Surveyed
BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0001F

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

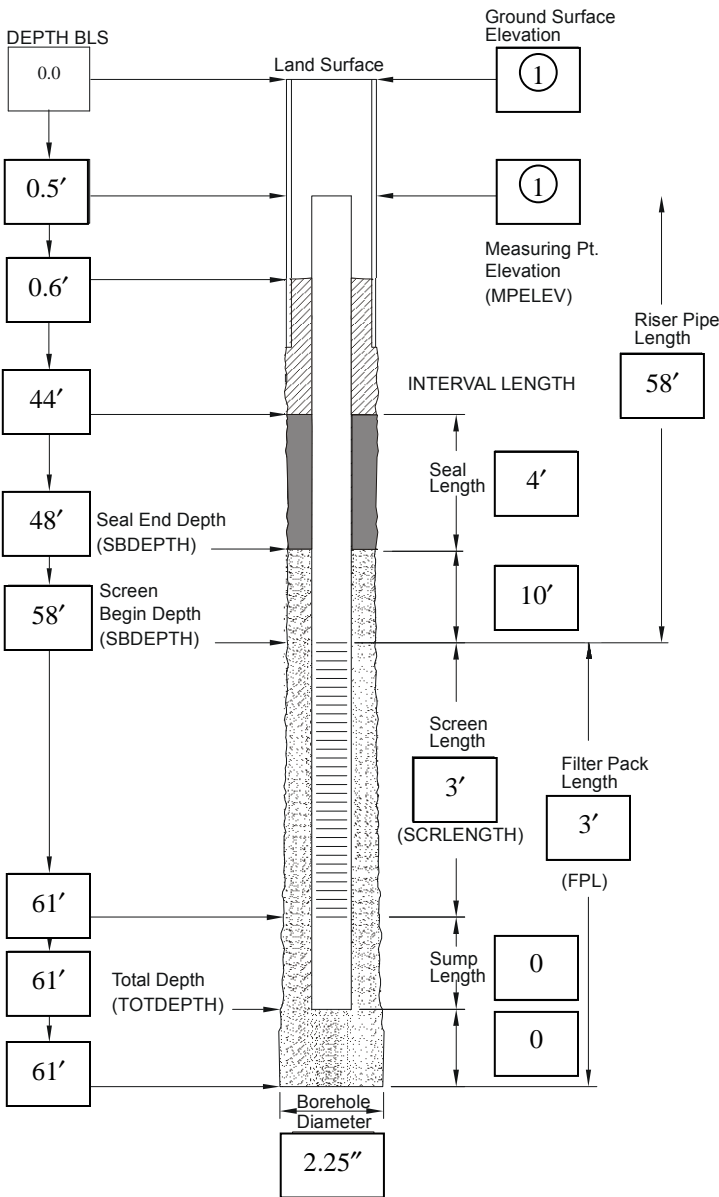
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU
Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0001 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002A

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

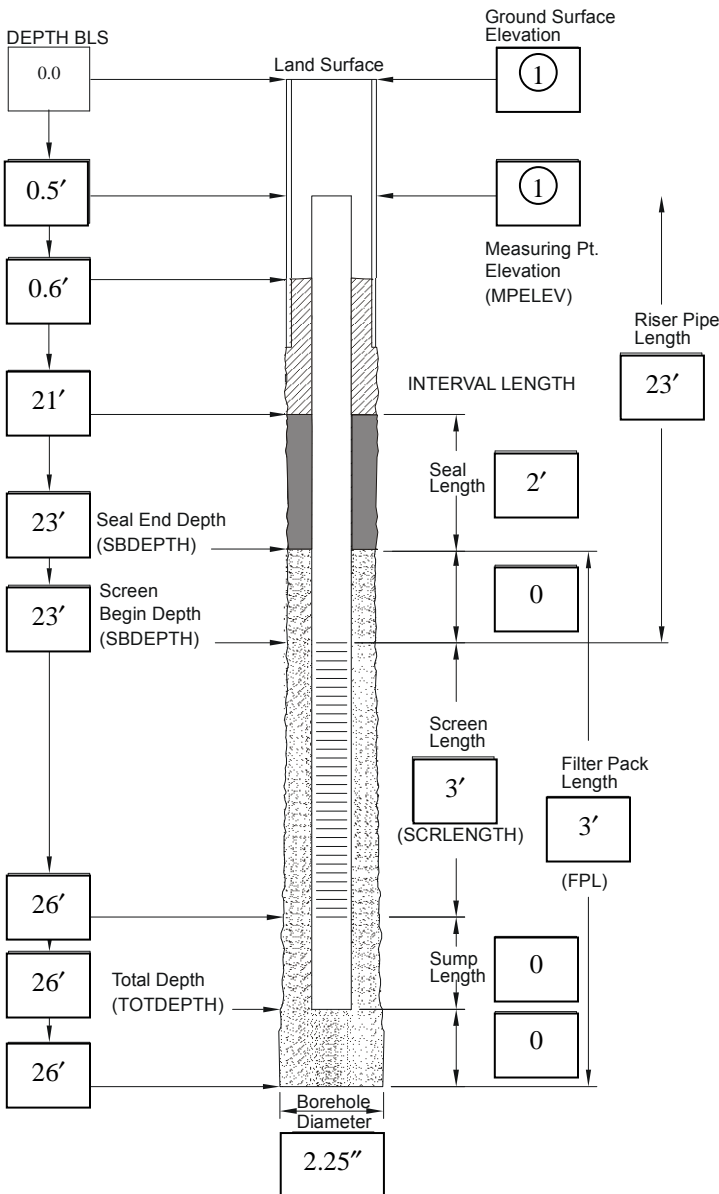
Casing Installation Date: 1/20/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/20/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002B

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

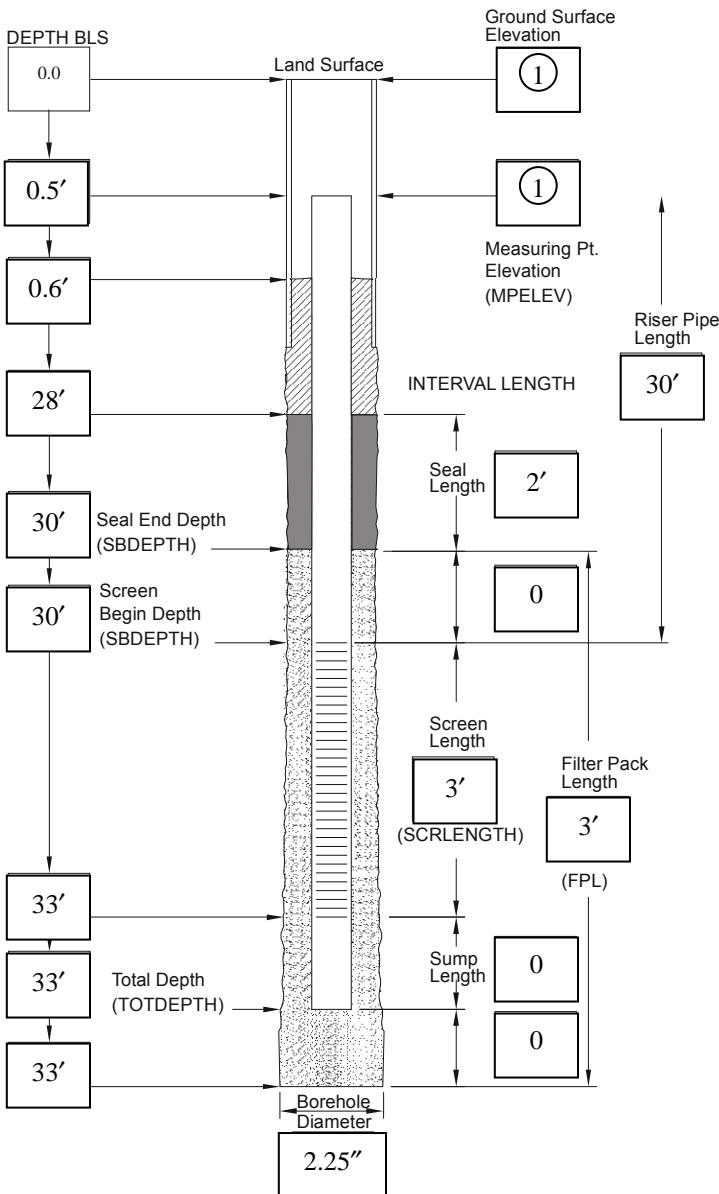
Casing Installation Date: 1/21/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 3

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002C

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

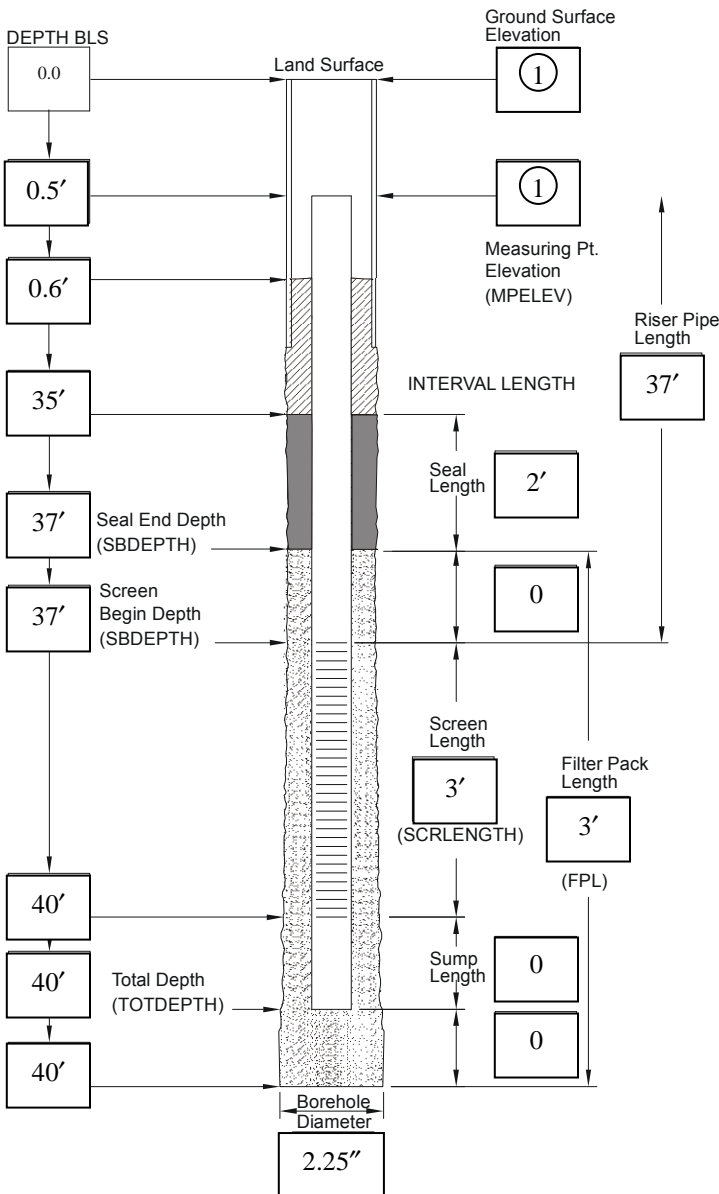
Casing Installation Date: 1/21/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 6.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002D

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

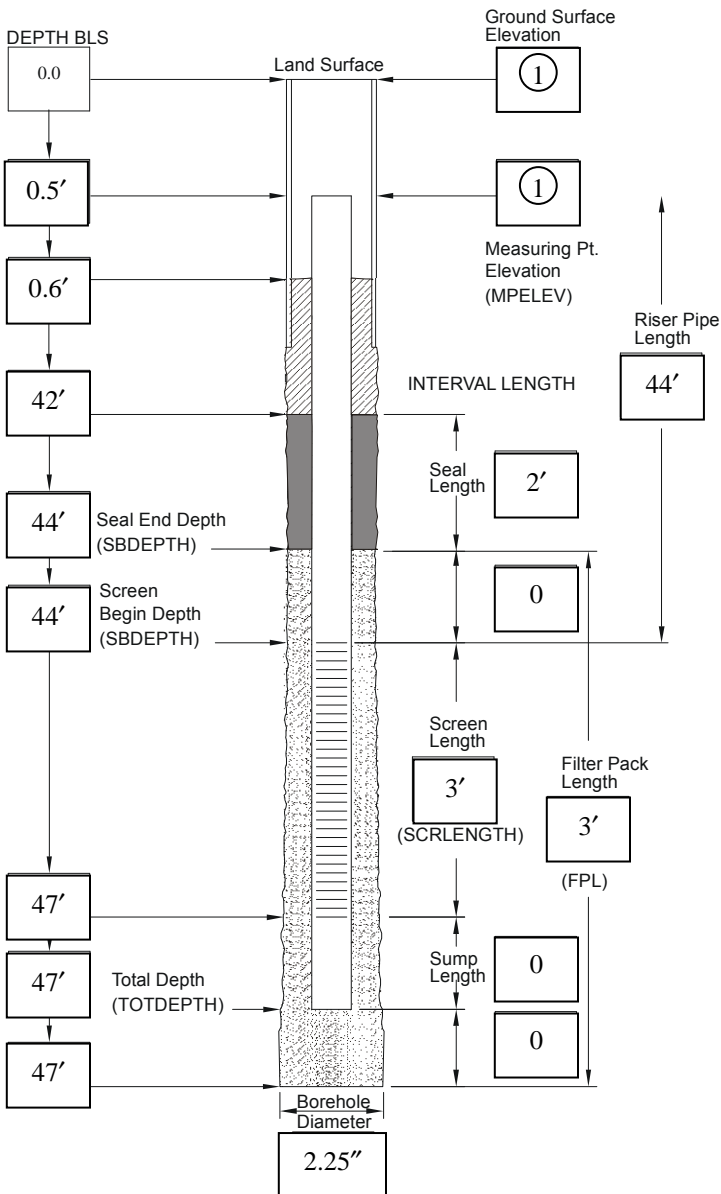
Casing Installation Date: 1/21/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002E

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

Casing Installation Date: 1/24/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial

Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/24/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

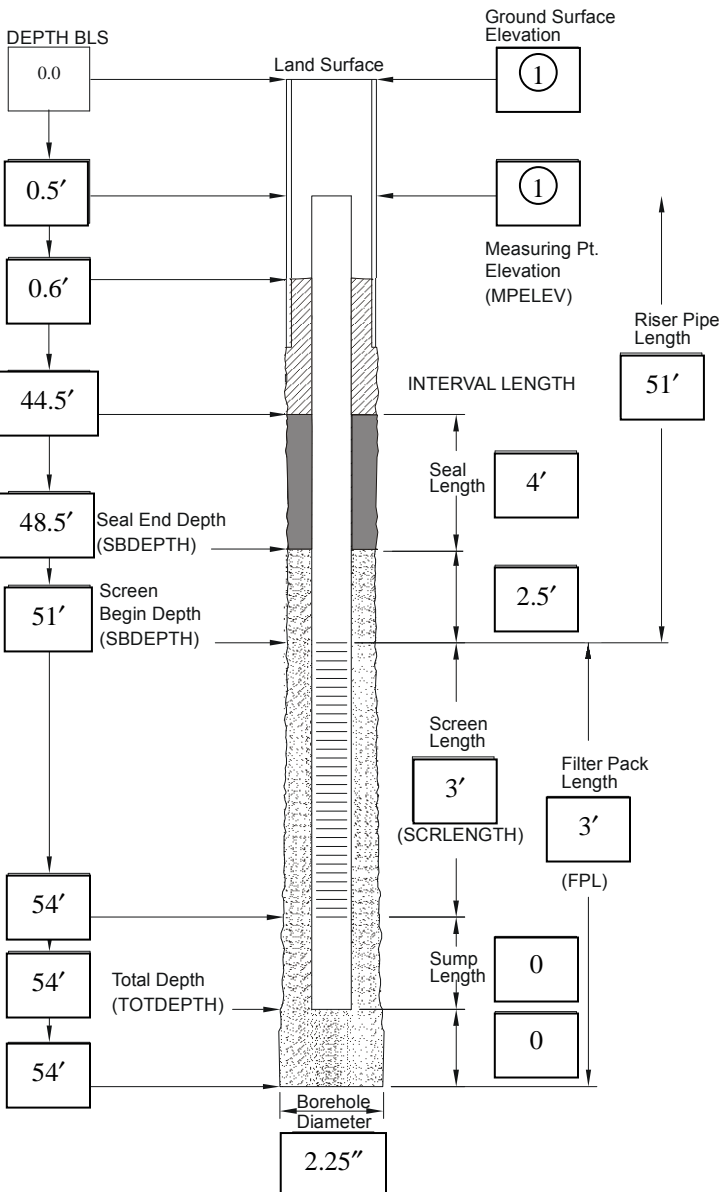
Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By: *[Signature]* Date: 2/1/11



Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0002F

Site: LC34

Drilling Company: EDS


Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

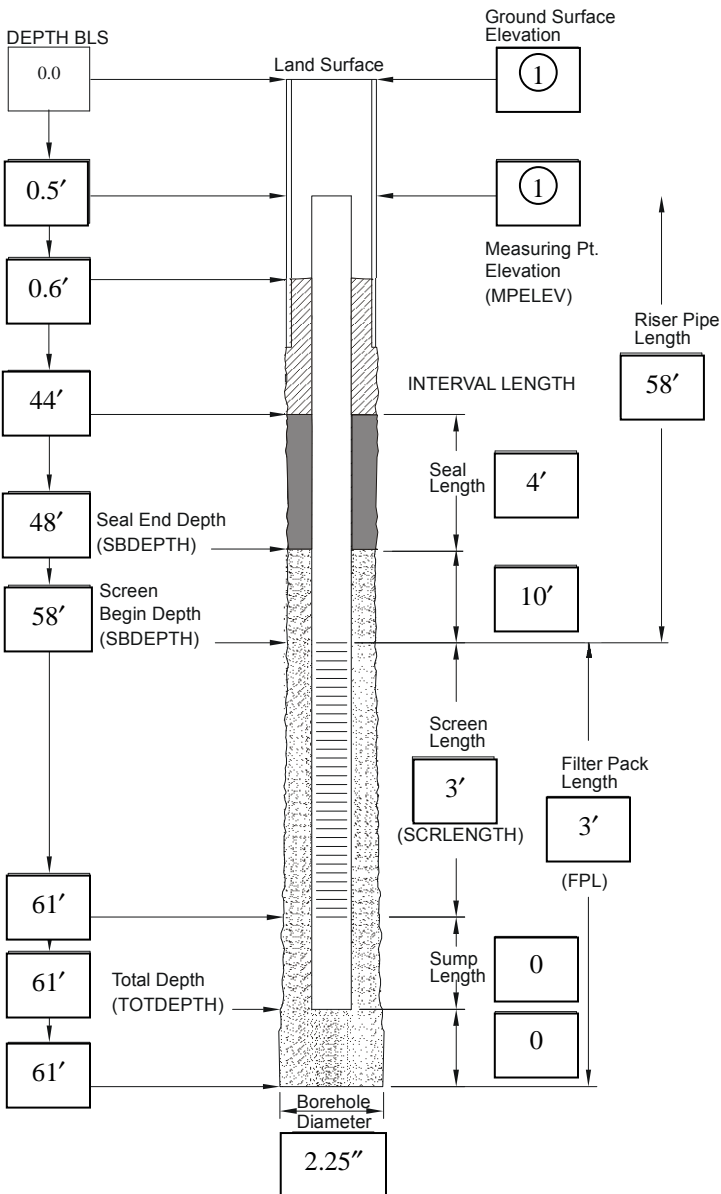
Casing Installation Date: 1/21/2011

Signature:  For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By:  Date: 2/1/11

Comments

① Not Surveyed

BW0002 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003A

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

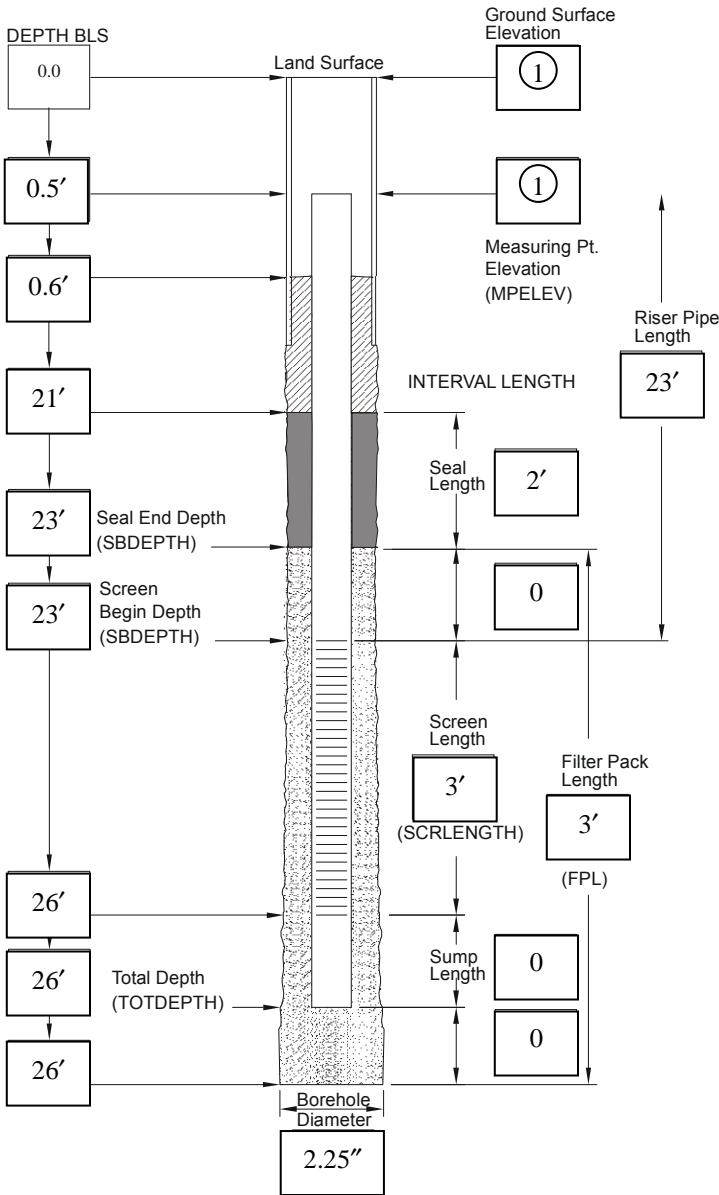
Casing Installation Date: 1/21/2011

Signature: *Neil Stapley* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Sand Silica Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 5

Reviewed

By: *Neil Stapley* Date: 2/1/11

Comments

① Not Surveyed

BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003B

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

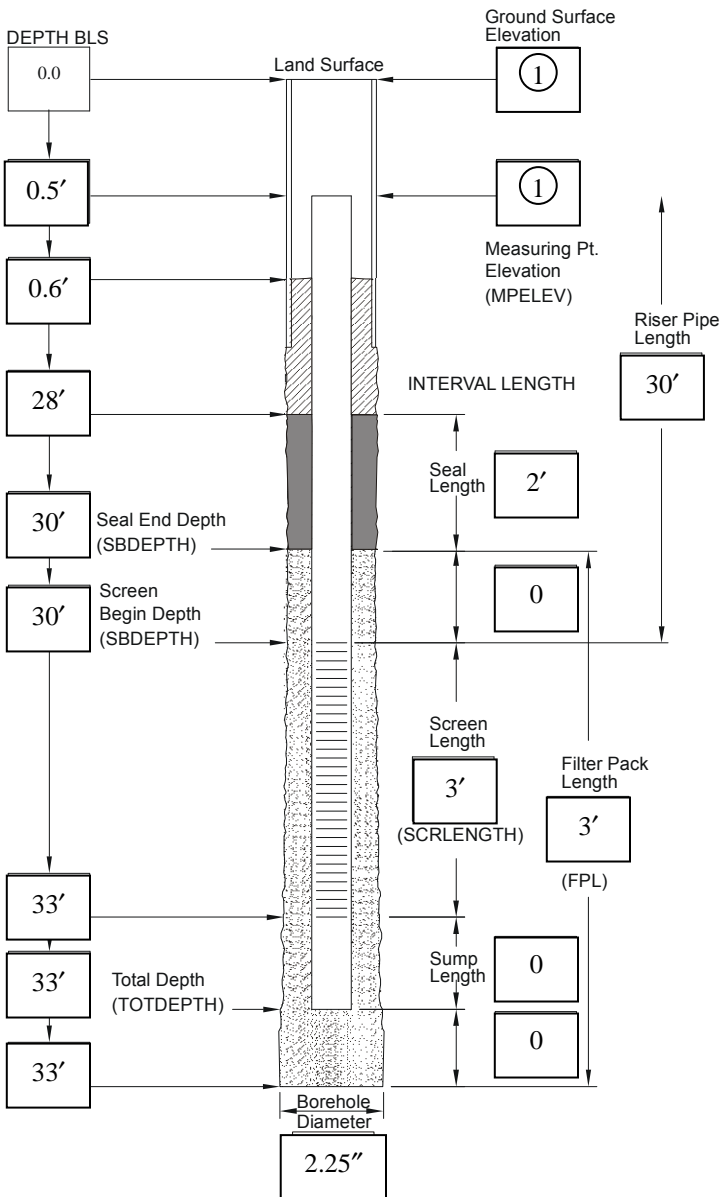
Casing Installation Date: 1/24/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/24/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003C

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

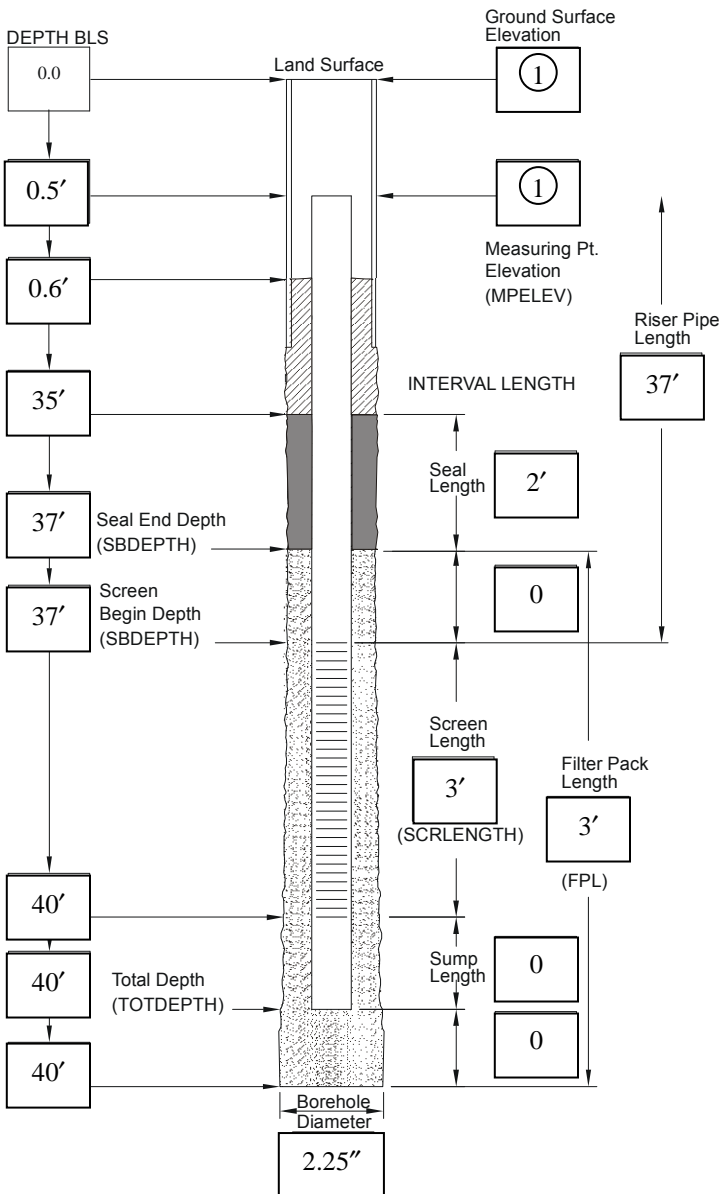
Casing Installation Date: 1/24/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/24/2011

Type: 30/45 Silica Sand

Source: Standard Sand and Silica (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y / N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4.5

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003D

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

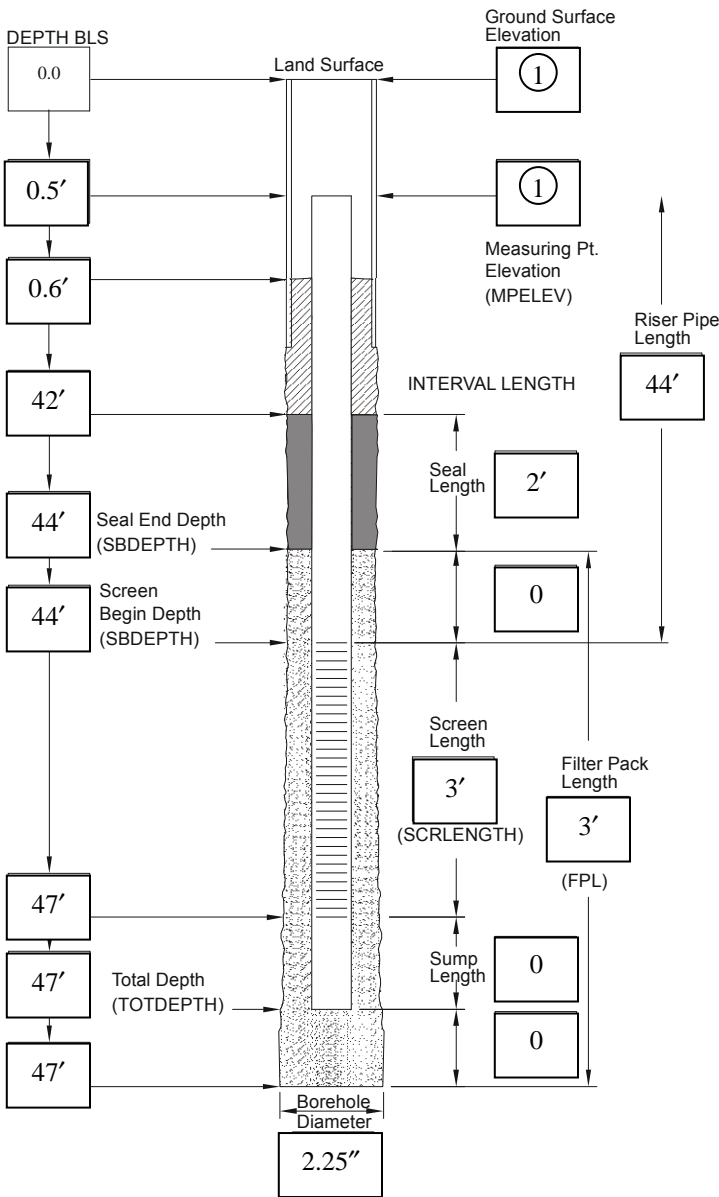
Casing Installation Date: 1/21/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 6

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003E

Site: LC34

Drilling Company: EDS


Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

Casing Installation Date: 1/24/2011

Signature:  For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial

Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/24/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

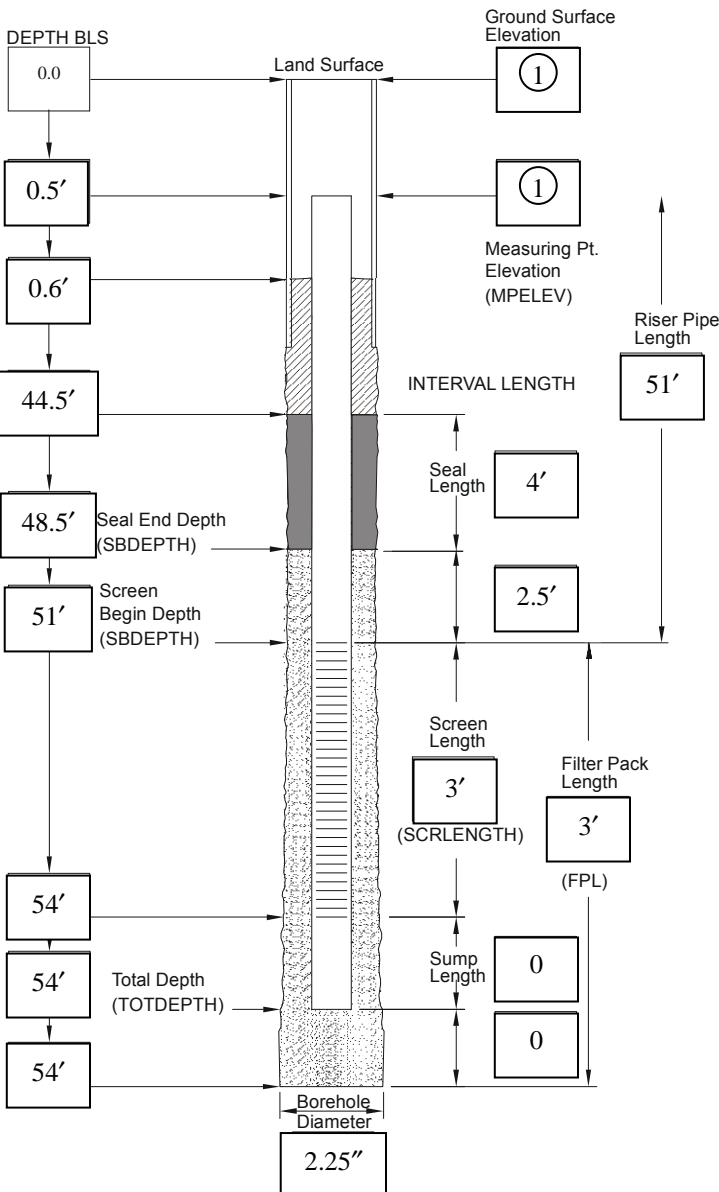
Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 5

Reviewed

By:  Date: 2/1/11



Comments

① Not Surveyed
BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – BW0003F

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Chris Phelps, Keith Olson

Installation Method: DPT

Geologist/Engineer: Neil Stapley

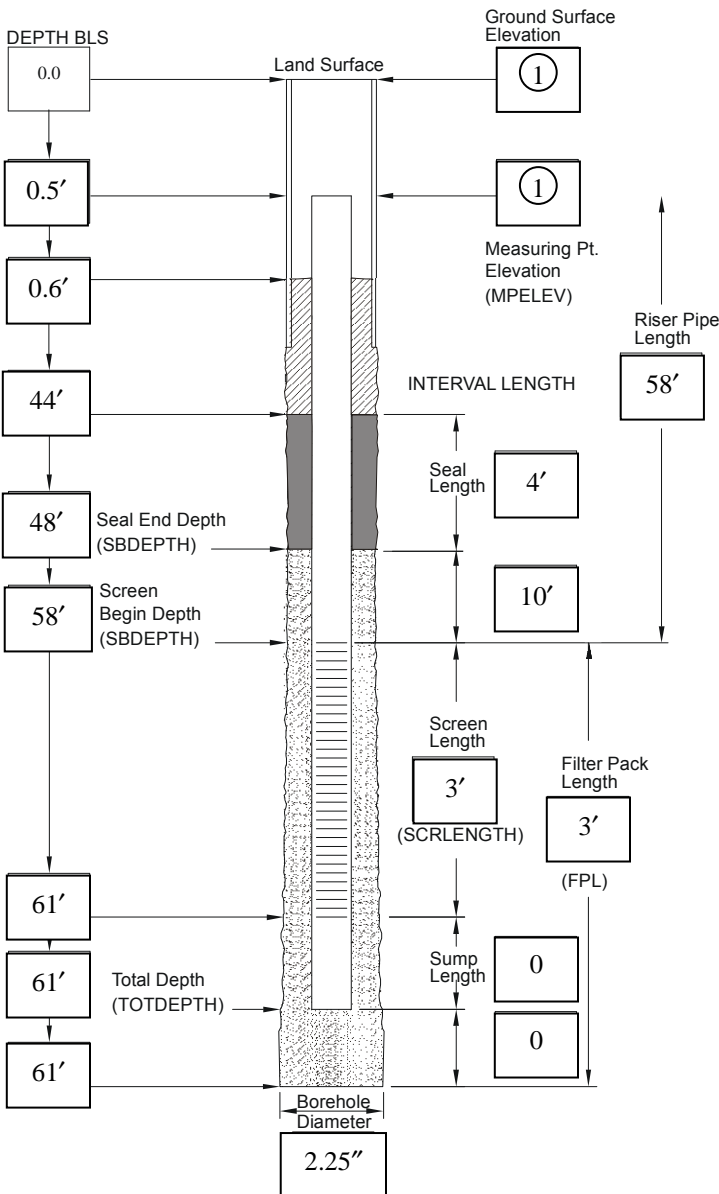
Casing Installation Date: 1/21/2011

Signature: *[Signature]* For N.S.

Well Type: Monitoring Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/25/2011

Surface Pad Size: 4 ft x 6 ft

Protective Casing or Cover

Diameter/Type: 8" Steel Manhole

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement

Placement Method: Direct Pour

Seal

Date: 1/21/2011

Type: Bentonite Sleeve

Source: Geosight

Set-up/Hydration Time: ~ 45 min.

Placement Method: Threaded PVC

Vol. Fluid Added: ~ 5 gal.

Filter Pack

Type: 20/30 Silica Sand Pre-Pack

Source: Geosight

Amount Used: NA

Placement Method: Threaded PVC

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 3/4 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 3/4 in.

Screen Slot Size: 0.010 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: 0.2" Bottom Plug (part of pre-pack)

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): NA

Recovered (Gal): ~ 4

Reviewed

By: *[Signature]* Date: 2/1/11

Comments

① Not Surveyed

BW0003 A-F in same pad.

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0013

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

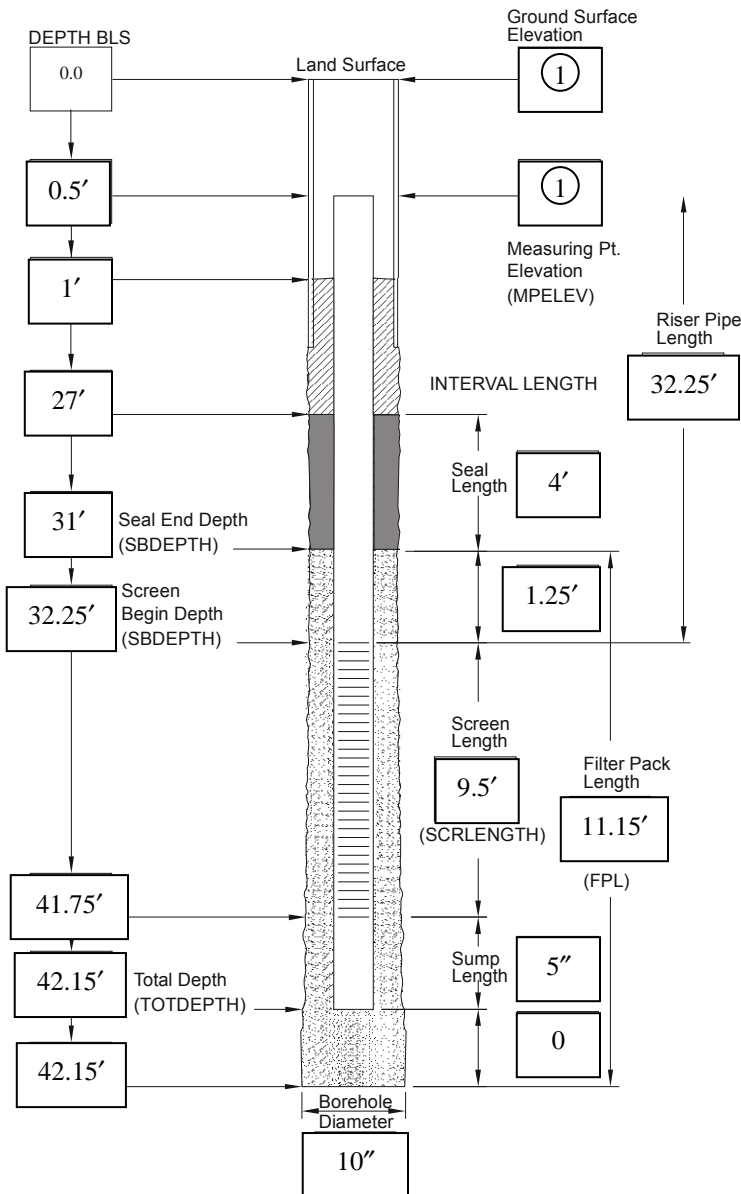
Casing Installation Date: 1/20/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/21/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/20/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 15 - 20 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 11 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0013 and IJ0014)

Recovered (Gal): ~ 30

Reviewed

By: *Janet Longalk* Date: 1/31/11

Comments

① Not Surveyed

IJ0013 and IJ0014 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0014

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

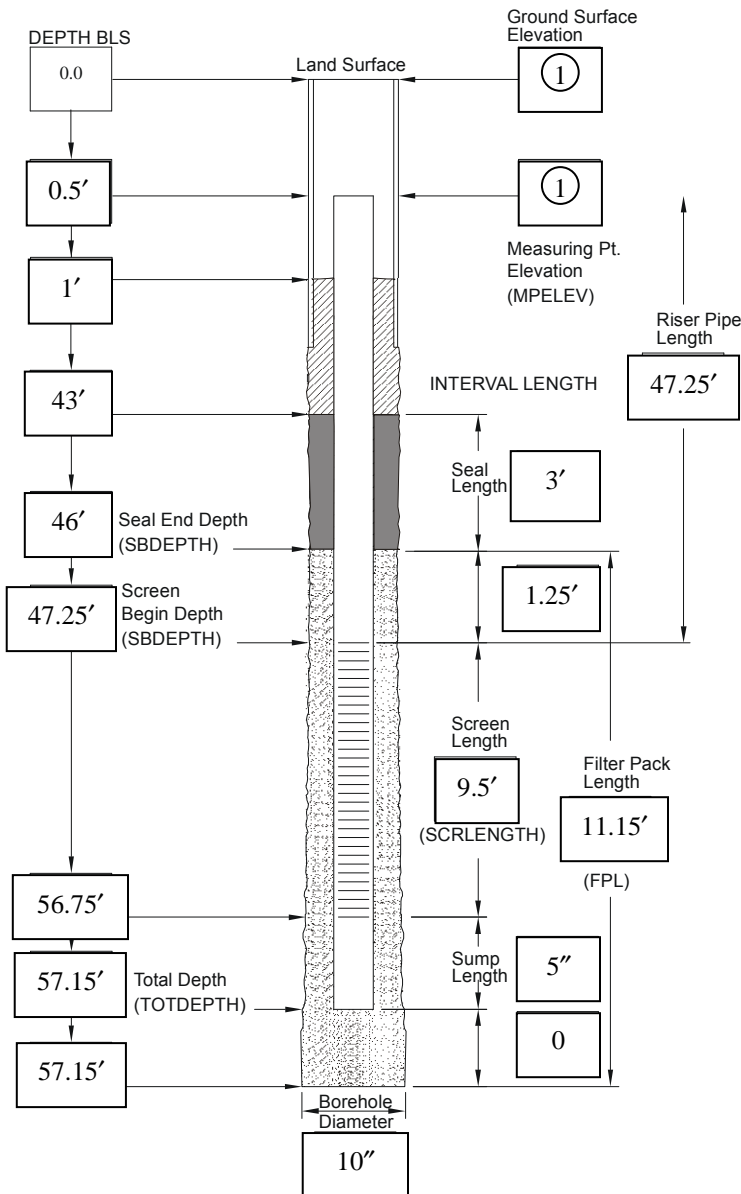
Casing Installation Date: 1/20/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/21/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/20/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 13 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0013 and IJ0014)

Recovered (Gal): ~ 30

Reviewed

By: *John J. Lyall* Date: 1/31/11

Comments

① Not Surveyed

IJ0013 and IJ0014 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0015

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

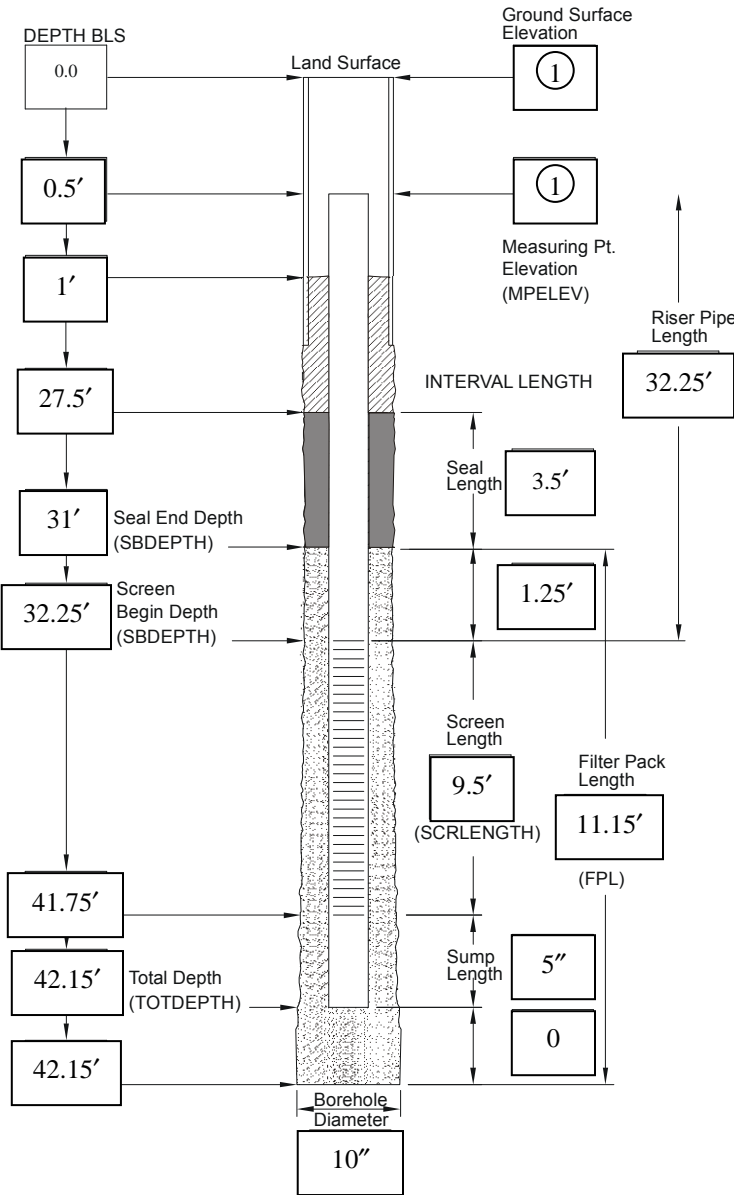
Casing Installation Date: 1/20/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/20/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 15 - 20 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 10 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0015 and IJ0016)

Recovered (Gal): ~ 35

Reviewed

By: *John J. Longwell* Date: 1/31/11

Comments

① Not Surveyed

IJ0015 and IJ0016 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0016

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

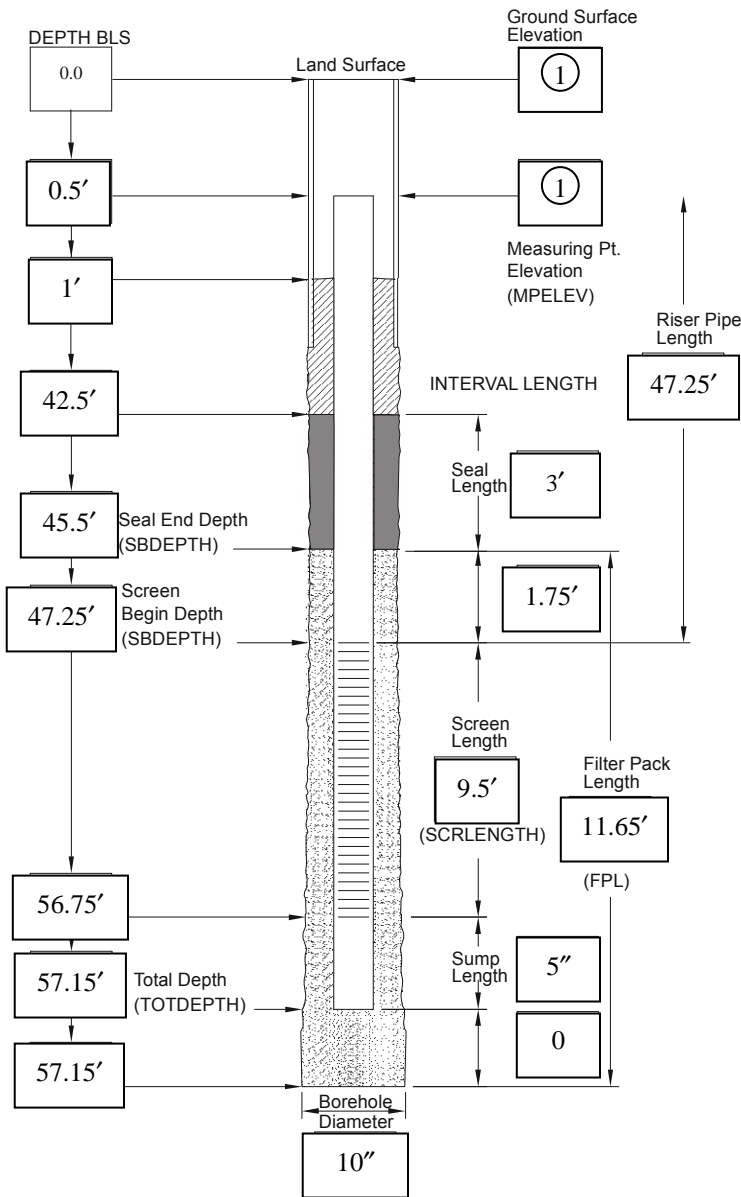
Casing Installation Date: 1/20/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/20/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 12 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0015 and IJ0016)

Recovered (Gal): ~ 30

Reviewed

By: *Janet Longwell* Date: 1/31/11

Comments

① Not Surveyed

IJ0015 and IJ0016 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0017

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

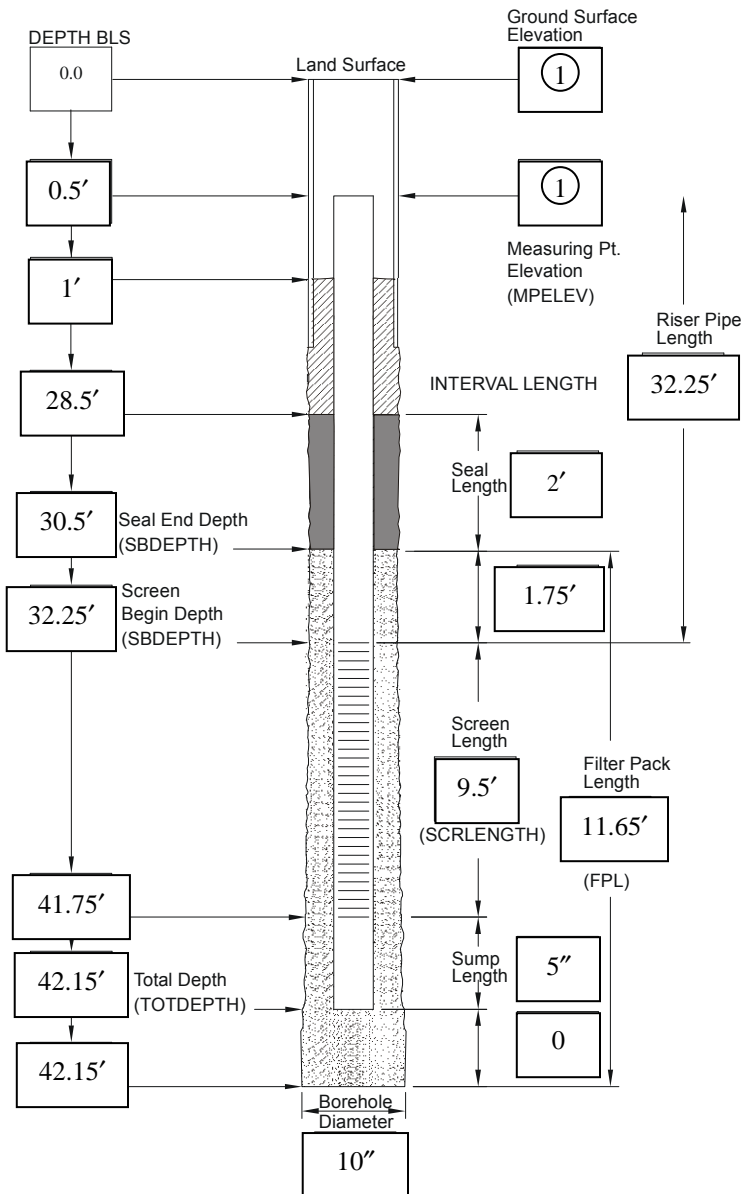
Casing Installation Date: 1/18/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags/~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 15 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 10 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0017 and IJ0018)

Recovered (Gal): ~ 12

Reviewed

By: *John J. [Signature]* Date: 1/31/11

Comments

① Not Surveyed

IJ0017 and IJ0018 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0018

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

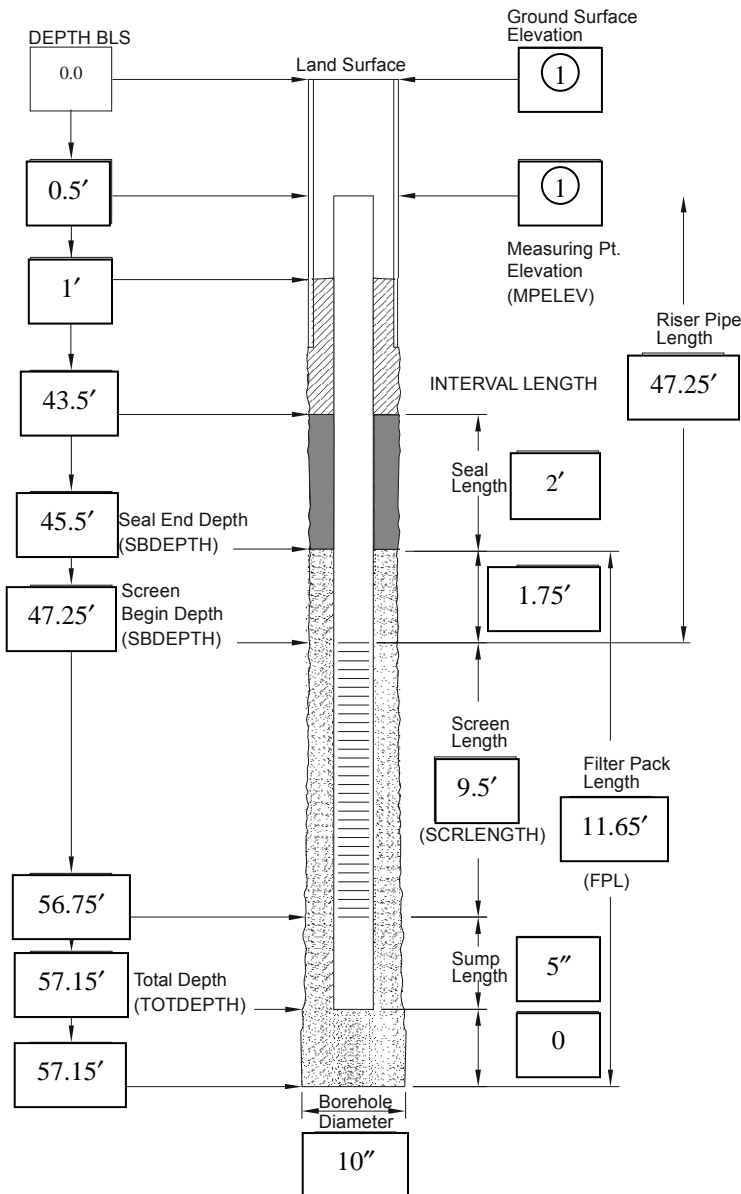
Casing Installation Date: 1/18/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 12 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0017 and IJ0018)

Recovered (Gal): ~ 25

Reviewed

By: *John J. Lyall* Date: 1/31/11

Comments

① Not Surveyed

IJ0017 and IJ0018 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0019

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

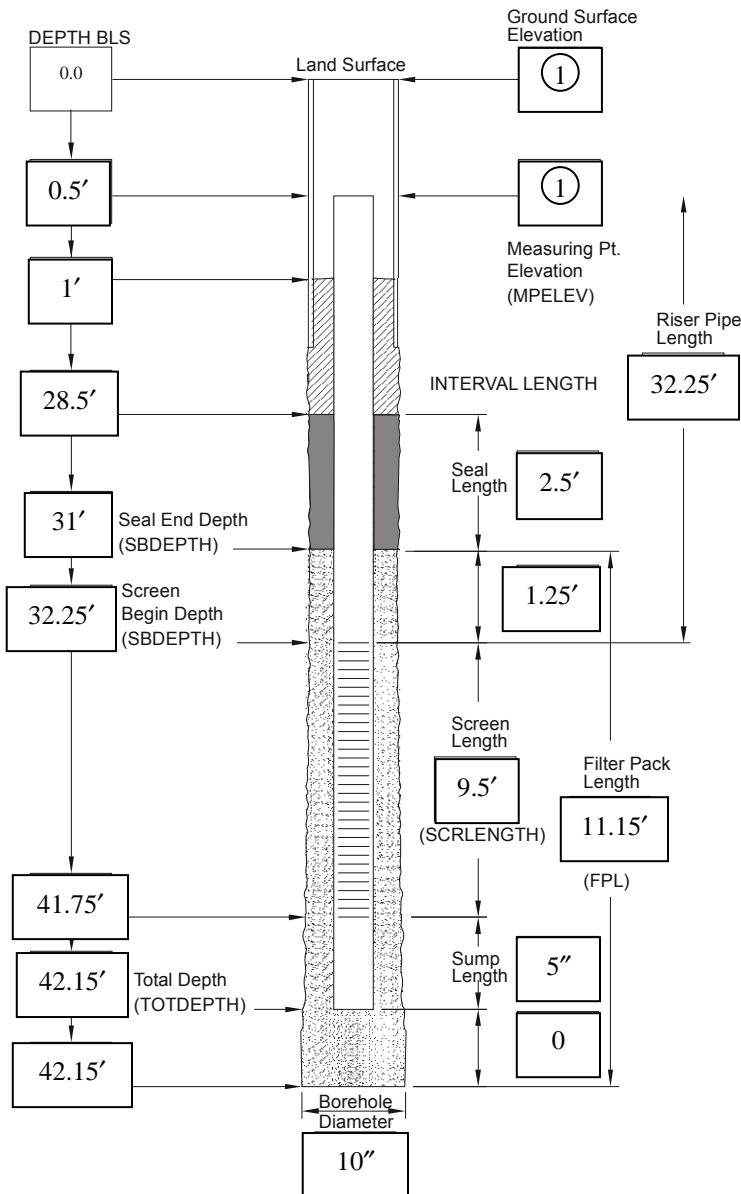
Casing Installation Date: 1/18/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 15 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 12 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0019 and IJ0020)

Recovered (Gal): ~ 30

Reviewed

By: *Jan J. Longalk* Date: 1/31/11

Comments

① Not Surveyed

IJ0019 and IJ0020 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0020

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

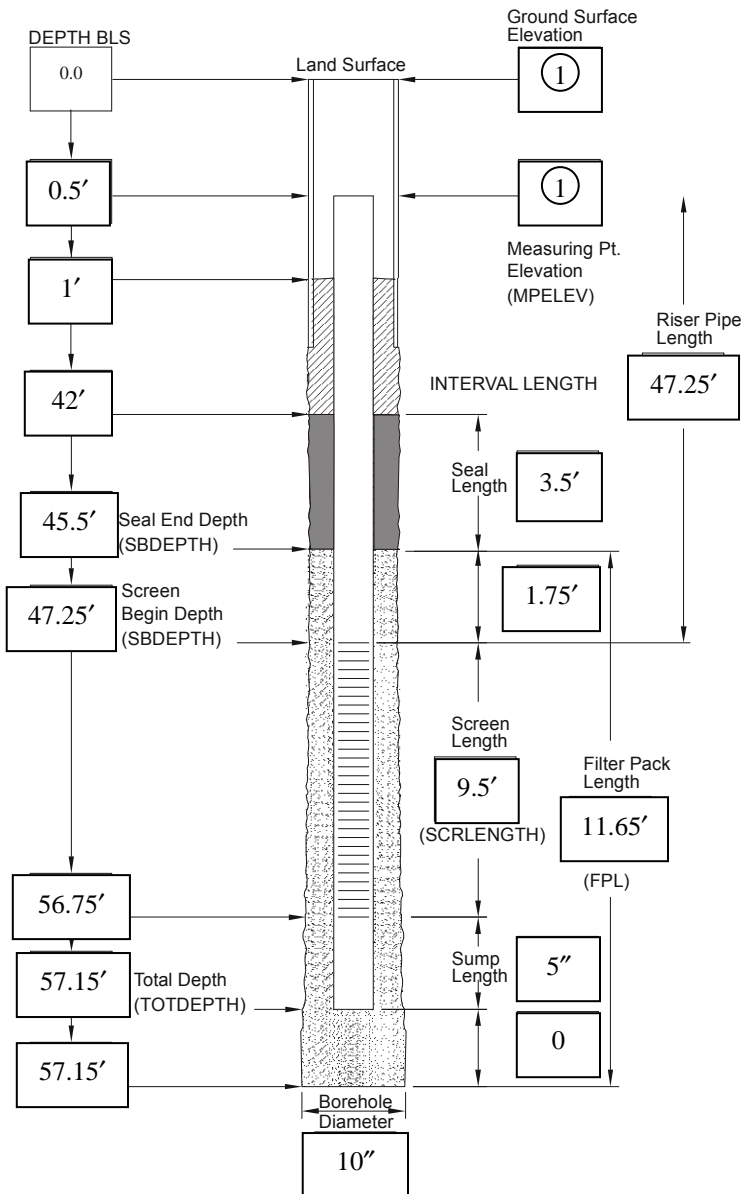
Casing Installation Date: 1/18/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 3/4 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 12 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0019 and IJ0020)

Recovered (Gal): ~ 35

Reviewed

By: *John J. Lygall* Date: 1/31/11

Comments

① Not Surveyed

IJ0019 and IJ0020 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0021

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

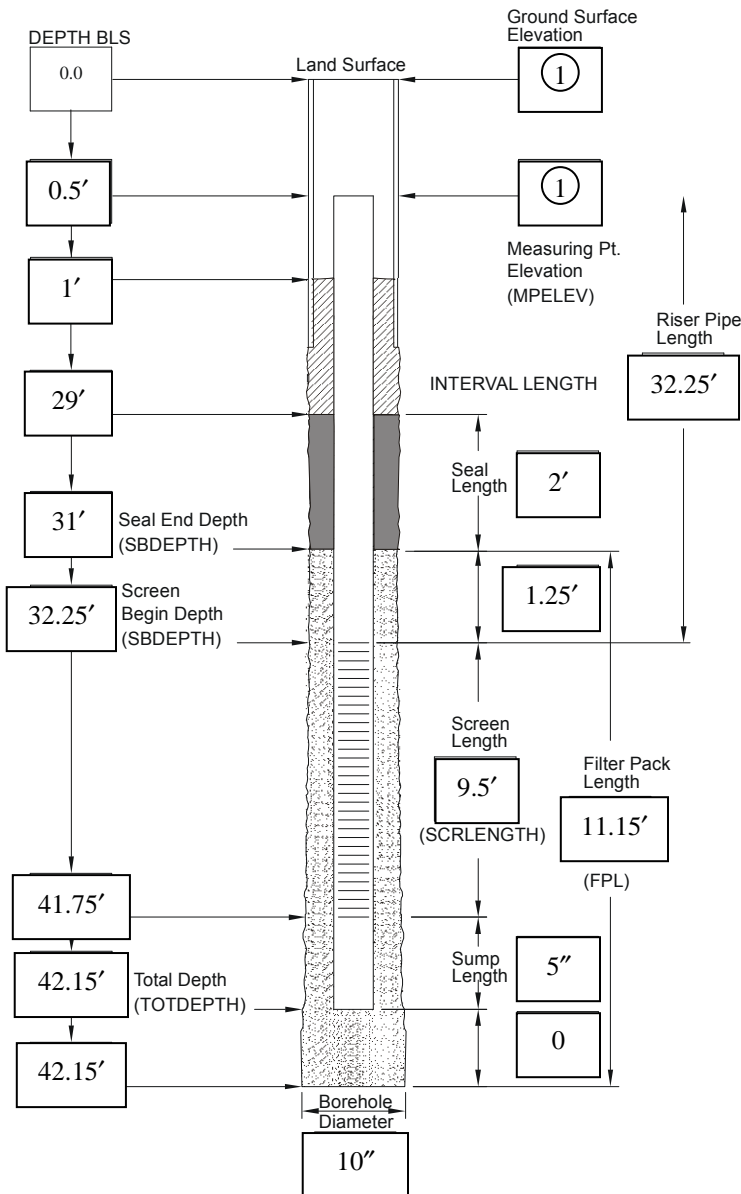
Casing Installation Date: 1/18/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 20 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 10 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0021 and IJ0022)

Recovered (Gal): ~ 20

Reviewed

By: *J. J. [Signature]* Date: 1/31/11

Comments

① Not Surveyed

IJ0021 and IJ0022 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – IJ0022

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

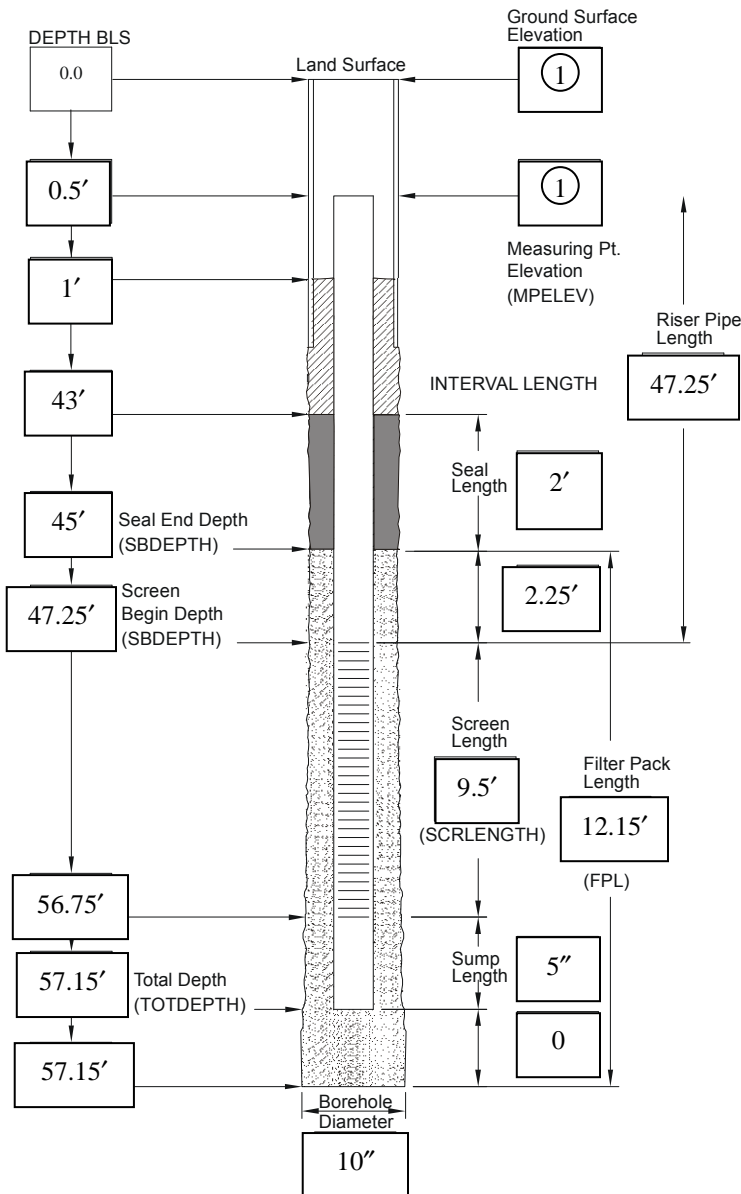
Casing Installation Date: 1/17/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 4 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/18/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1/2 bag / 50 lb. bag)

Set-up/Hydration Time: 0 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 9 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 2 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 2 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 5 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 75 (for IJ0021 and IJ0022)

Recovered (Gal): ~ 20

Reviewed

By: *J. J. [Signature]* Date: 1/31/11

Comments

① Not Surveyed

IJ0021 and IJ0022 installed in same borehole

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – RW0007

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

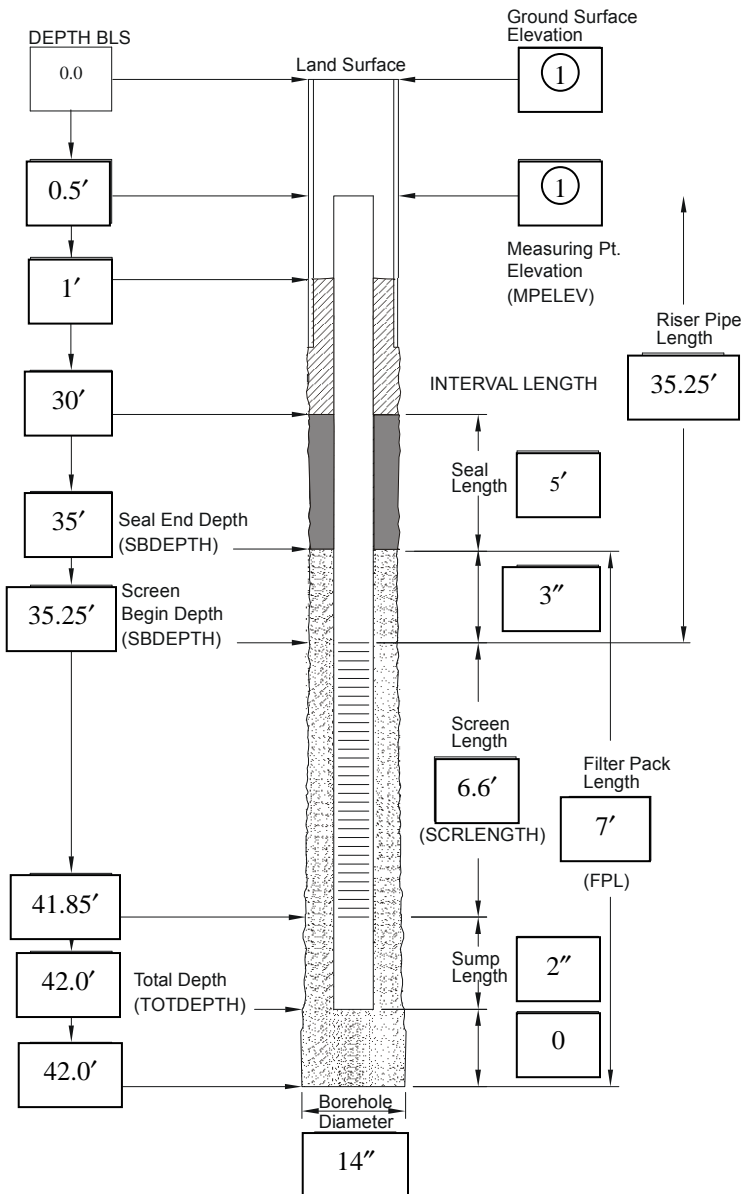
Casing Installation Date: 1/21/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 6 bags / ~ 45 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/21/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1 bag / 50 lb. bag)

Set-up/Hydration Time: 15 - 20 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 9 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 6 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 6 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 2 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 180

Recovered (Gal): ~ 85

Reviewed

By: *Jan D. Longwell* Date: 3/8/11

Comments

① Not Surveyed
Cut 10 ft screen to make 7 ft screen, attached slip cap on
with screws

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D.: LC34 – RW0008

Site: LC34

Drilling Company: EDS

Project Number: TR0272

Drillers: Mike Miller, Cory Cone, Carl Leonhardt

Installation Method: HSA

Geologist/Engineer: Rebecca Daprato

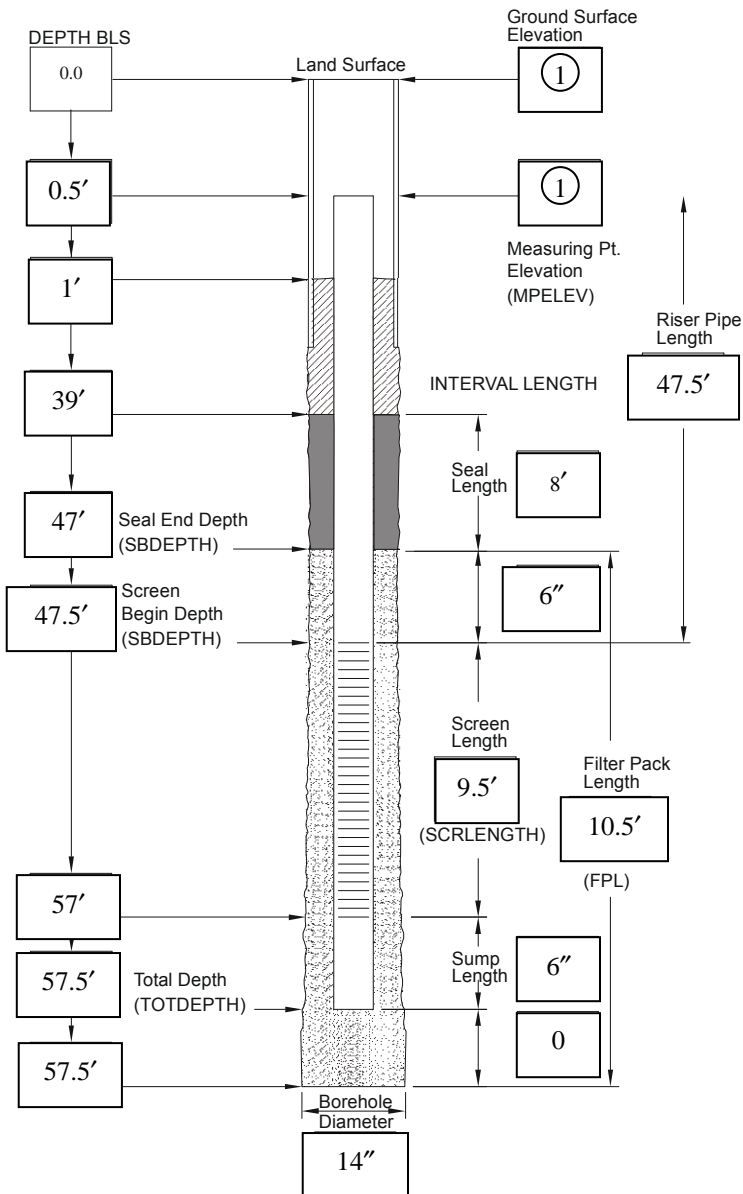
Casing Installation Date: 1/19/2011

Signature: *Rebecca Daprato*

Well Type: Injection Well

Well Completion Method: Flush Mount

Geologic Completion Zone: Surficial



Well Completion

Guard Posts (Y / N) Date: 1/24/2011

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 18" x 18" x 10" Vault Box

Depth BGS: - Weep Hole (Y / N)

Grout

Composition/Proportions: ASTM C1157, Type GU

Portland/Limestone Cement (~ 5 bags / ~ 20 gal.)

Placement Method: Tremie w/ pump

Seal

Date: 1/19/2011

Type: Bentonite Chips (3/8")

Source: Hole Plug (~ 1 bag / 50 lb. bag)

Set-up/Hydration Time: 15 - 20 min.

Placement Method: Direct Pour

Vol. Fluid Added: 0 gal., water added to casing for install

Filter Pack

Type: 6/20 Silica Sand

Source: Standard Sand and Silica

Amount Used: ~ 13 bags (50 lb. bag)

Placement Method: Direct Pour

Well Riser Pipe

Casing Material: SCH 40 PVC

Casing Inside Diameters: 6 in.

Screen

Material: SCH 40 PVC

Inside Diameter: 6 in.

Screen Slot Size: 0.020 in.

Percent Open Area: -

Sump or Bottom Cap (Y N)

Type/Length: ~ 6 in.

Backfill Plug (Y / N)

Material: -

Placement Method: -

Set-up/Hydration Time: -

Total Water Volume During Construction

Introduced (Gal): ~ 110

Recovered (Gal): ~ 100

Reviewed

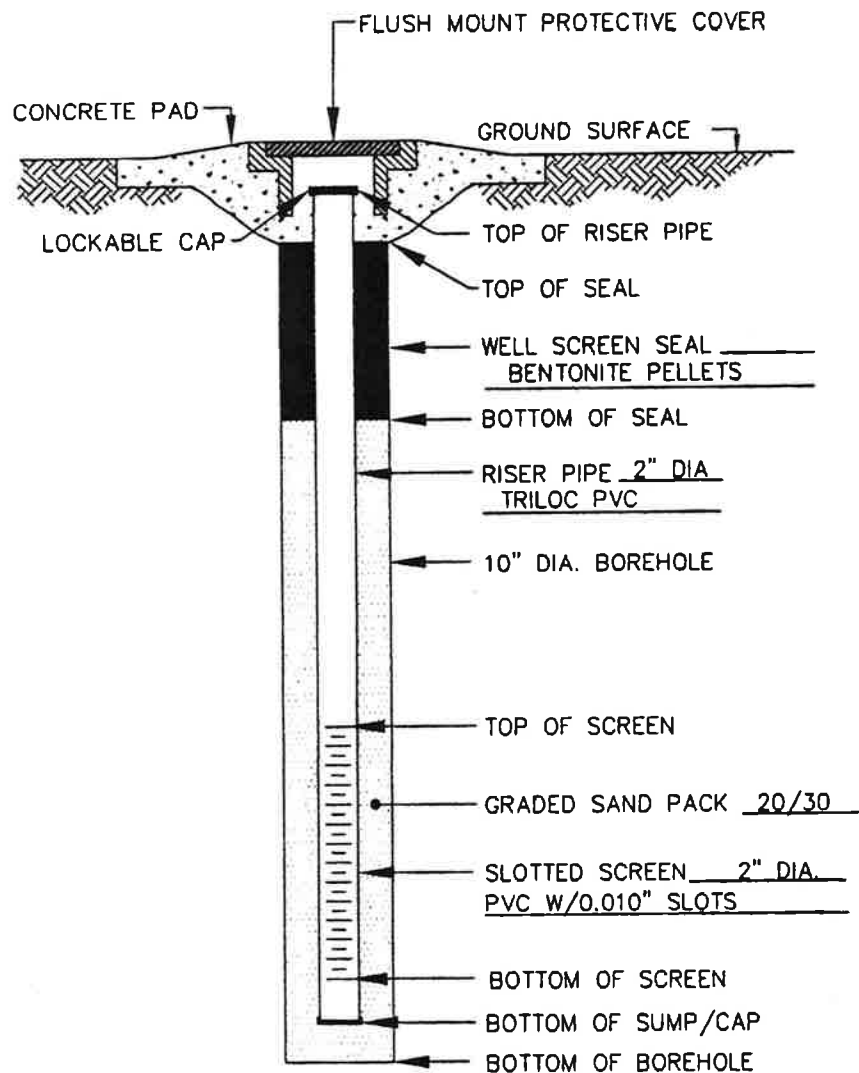
By: *Janet Longall* Date: 3/8/11

Comments

① Not Surveyed

Hole collapsed at top – possible old location of MW

Casing set at ~ 45 ft in clay



DEPTH	
0.0	
0.4	
1.0	
1.5	
2.0	
12.0	
12.0	
12.0	

WELL ID	LC34-IW-2S
ELEV. TOP OF RISER	8.57
ELEV. GROUND SURFACE	9.02
SCREENED INTERVAL	-2.98 TO 7.02
DATE INSTALLED	02/12/98

Construction Notes: _____

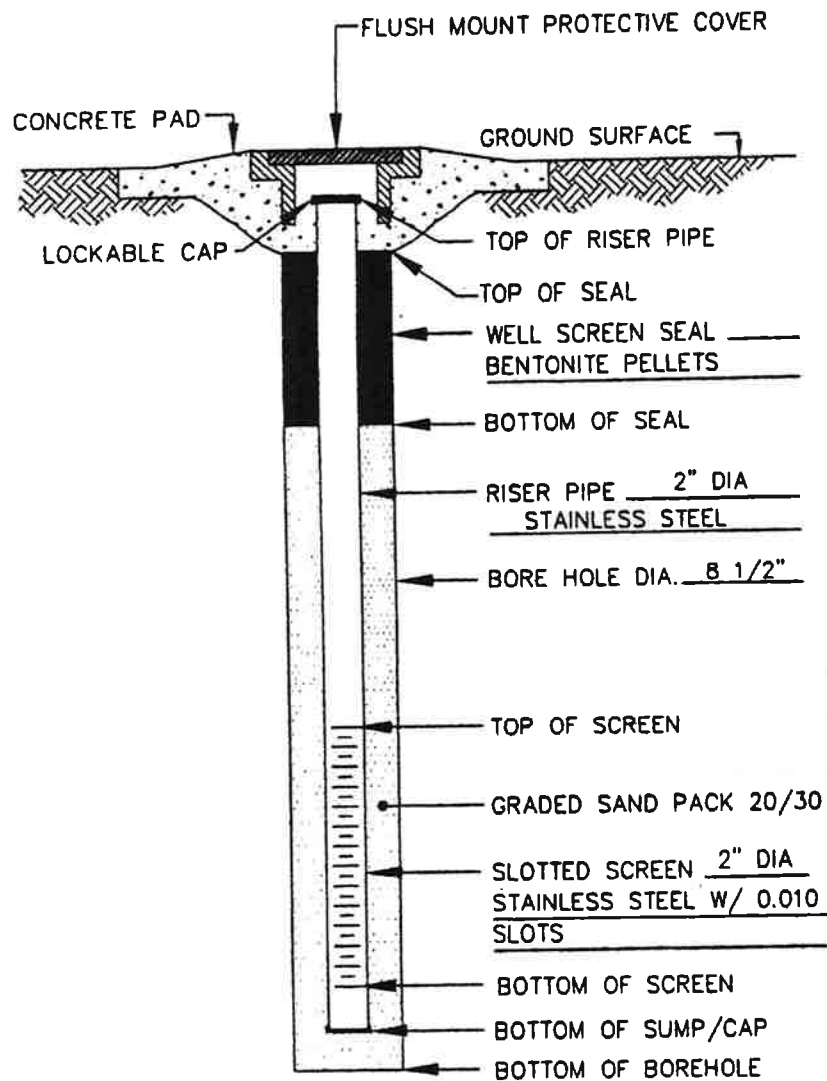
Remarks: _____

SECTION VIEW

- NOTE:**
- 1.) ALL DEPTHS AND ELEVATIONS ARE IN FEET.
 - 2.) ELEVATIONS REFERENCED TO PROJECT BENCHMARK.



11/25/98 Date	Rev. No.	22778-05-001 Drawing No.	NASA KENNEDY SPACE CENTER, FLORIDA Client	LAUNCH COMPLEX 34 CAPE CANAVERAL AIR STATION, FLORIDA Project Location	MONITOR WELL CROSS-SECTION	Fig No.
MKL Drawn by	Checked By	Approved By				



DEPTH	
0.0	
0.4	
22.0	
23.0	
25.0	
30.0	
30.0	
30.0	

WELL ID	LC34-IW-21
ELEV. TOP OF RISER	8.54
ELEV. GROUND SURFACE	8.94
SCREENED INTERVAL	-21.06 TO -16.06
DATE INSTALLED	05/22/97

Construction Notes: WELL CONSTRUCTED OF STAINLESS STEEL RISER AND SCREEN.

Remarks:

SECTION VIEW

- NOTE:**
- ALL DEPTHS AND ELEVATIONS ARE IN FEET.
 - ELEVATIONS REFERENCED TO PROJECT BENCHMARK.



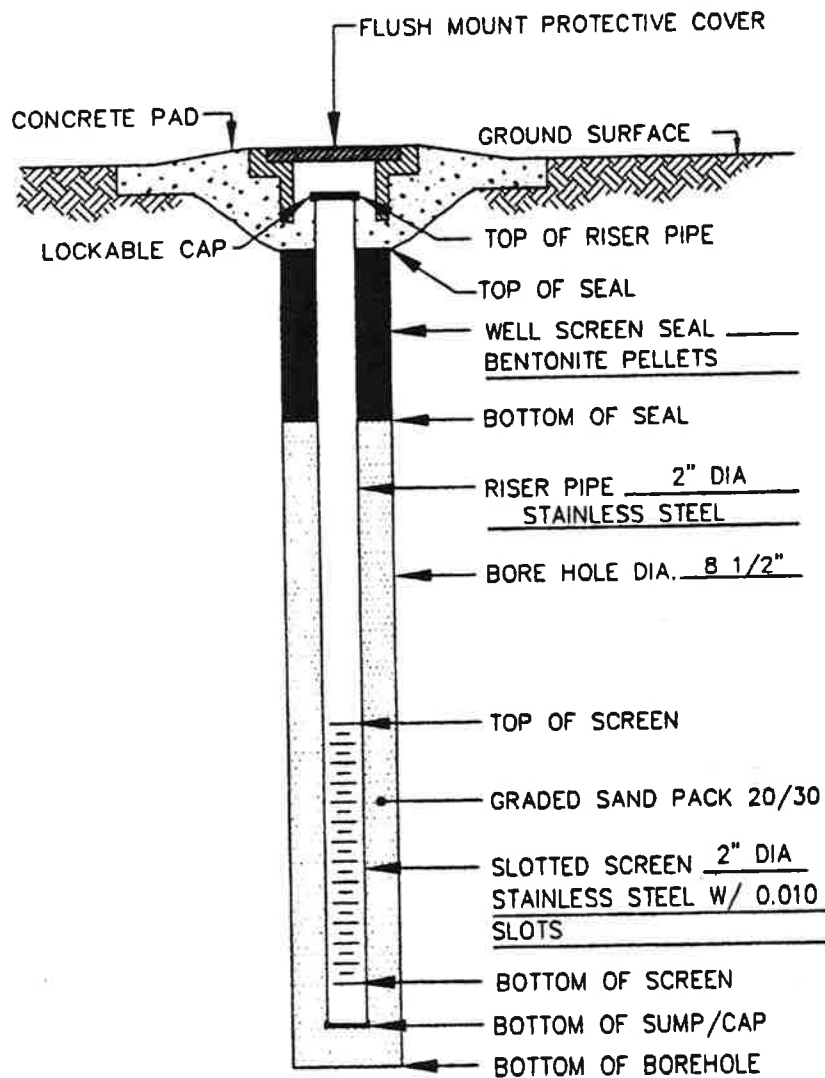
12/9/97 Date	Rev. No.	6E-2778-A4 Drawing No.
MKL Drawn by	Checked By	Approved By

NASA
KENNEDY SPACE CENTER, FLORIDA
Client

LAUNCH COMPLEX 34
CAPE CANAVERAL AIR STATION, FLORIDA
Project Location

**MONITOR WELL
CROSS-SECTION**

Fig No.



DEPTH	
0.0	
+0.3	
32.0	
33.0	
35.0	
40.0	
40.0	
40.0	

WELL ID	LC34-IW-2D
ELEV. TOP OF RISER	9.42
ELEV. GROUND SURFACE	9.14
SCREENED INTERVAL	-30.86 TO -25.86
DATE INSTALLED	05/22/97

Construction Notes: WELL CONSTRUCTED OF STAINLESS STEEL RISER AND SCREEN.

Remarks:

SECTION VIEW

- NOTE:**
- 1.) ALL DEPTHS AND ELEVATIONS ARE IN FEET.
 - 2.) ELEVATIONS REFERENCED TO PROJECT BENCHMARK.

G&E ENGINEERING
A Division of Tetra Tech - G&E CONSULTANTS
 ENVIRONMENTAL CONSULTANTS

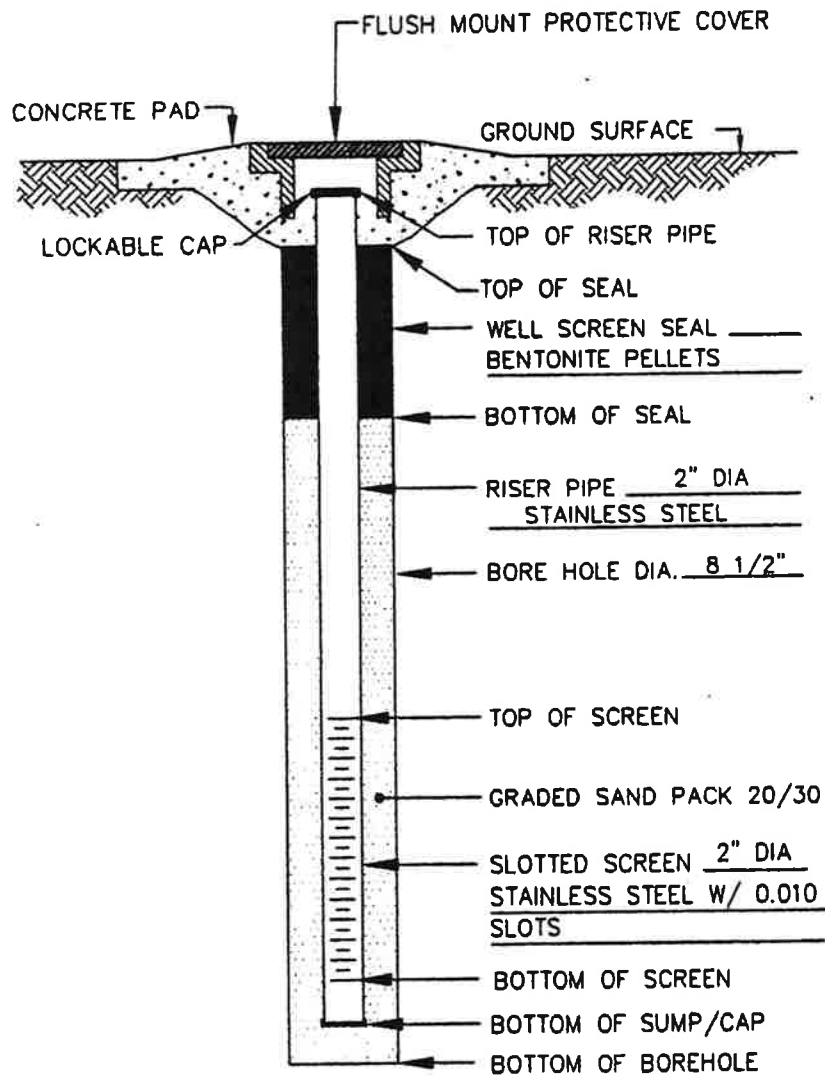
12/9/97 Date	Rev. No.	6E-2778-A5 Drawing No.
MKL Drawn by	Checked By	Approved By

NASA
 KENNEDY SPACE CENTER, FLORIDA
 Client

LAUNCH COMPLEX 34
 CAPE CANAVERAL AIR STATION, FLORIDA
 Project Location

**MONITOR WELL
 CROSS-SECTION**

Fig No.



DEPTH	
0.0	
0.2	
47.0	
48.0	
50.0	
55.0	
55.0	
55.0	

WELL ID LC34-IW-2D1

ELEV. TOP OF RISER 8.81

ELEV. GROUND SURFACE 8.99

SCREENED INTERVAL -46.01 TO -41.01

DATE INSTALLED 05/21/97 AND 05/22/97

Construction Notes: _____
 6" DIA PVC SURFACE CASING FROM 0'-45'
 WELL CONSTRUCTED OF STAINLESS STEEL SCREEN AND RISER.

Remarks: _____

SECTION VIEW

NOTE:

- 1.) ALL DEPTHS AND ELEVATIONS ARE IN FEET.
- 2.) ELEVATIONS REFERENCED TO PROJECT BENCHMARK.



12/9/97 Date	Rev. No.	6E-2778-A6 Drawing No.
MKL Drawn by	Checked By	Approved By

NASA
 KENNEDY SPACE CENTER, FLORIDA
 Client

LAUNCH COMPLEX 34
 CAPE CANAVERAL AIR STATION, FLORIDA
 Project Location

**MONITOR WELL
 CROSS-SECTION**

Fig No.



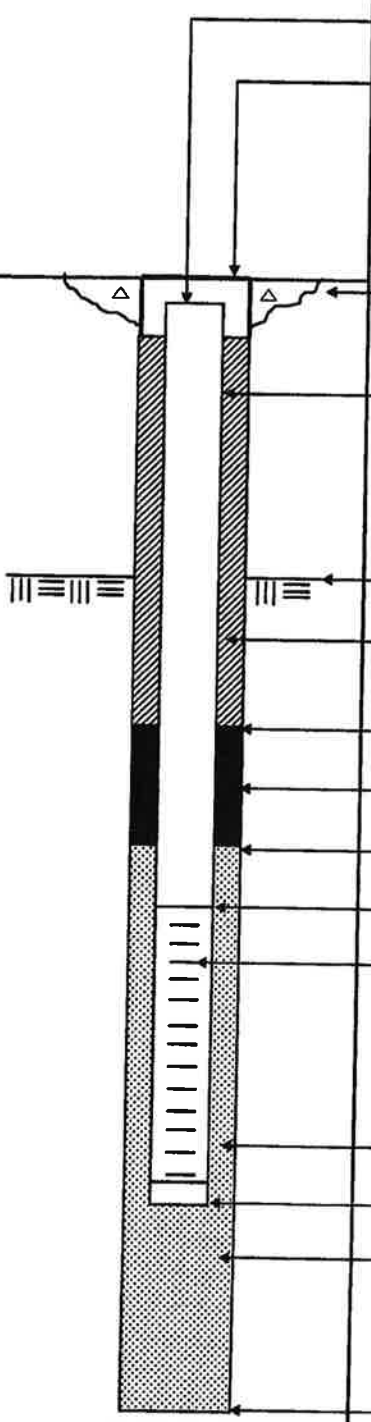
Tetra Tech NUS, Inc.

WELL No.: JW-67D

MONITORING WELL SHEET

PROJECT: CMS DRILLING Co.: Directec BORING No.: 0006
 PROJECT No.: MD N7675 1130 DRILLER: R. Bermudez G. Rozzano DATE COMPLETED: 5/16/05
 SITE: LC 34, CCAFS DRILLING METHOD: DPT NORTHING: 463737.06
 GEOLOGIST: Merv Dale DEV. METHOD: Peristaltic Pump EASTING: 242827.42

Ground Elevation = Datum:



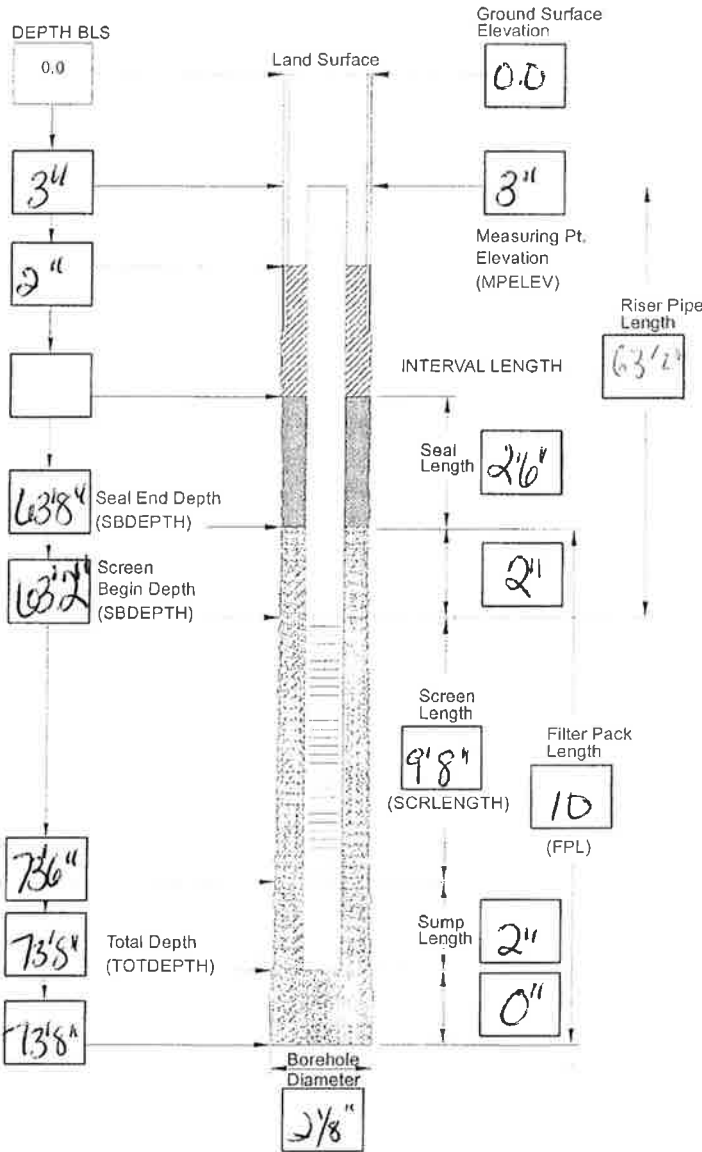
Elevation / Depth of Top of Riser: 13 INCH
 Elevation / Height of Top of Surface Casing: 19 INCH
 I.D. of Surface Casing: 6 INCH
 Type of Surface Casing: Steel bolt-down manhole
 Type of Surface Seal: Concrete
2 ft x 2 ft x 6 inch pad
 I.D. of Riser: 3/4 inch
 Type of Riser: Sch. 40 PVC
 Borehole Diameter: 2 1/8 inch
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: Type I Portland cement
 Elevation / Depth of Seal: N/A
 Type of Seal: N/A
 Elevation / Depth of Top of Filter Pack: 138 FT.
 Elevation / Depth of Top of Screen: 138 FT.
 Type of Screen: Sch. 40 PVC
 Slot Size x Length: 0.010 inch x 5 FT.
 I.D. of Screen: 3/4 inch
 Type of Filter Pack: 20/40 Filter Sand
 Elevation / Depth of Bottom of Screen: 143 FT.
 Elevation / Depth of Bottom of Filter Pack: 143 FT.
 Type of Backfill Below Well: NATURAL GROUND
 Elevation / Total Depth of Borehole: 143 FT.

Not to Scale

WELL CONSTRUCTION LOG STANDARD FLUSH MOUNT

Well I.D. (LOCID): IW-67-D1
 Drilling Company: DiracTec, LLC
 Drillers: David Webb and Rueben Bermudez
 Geologist/Engineer: Melissa Hensley/Dave Sizemore
 Signature: Melissa Hensley

Site: LC 34
 Installation Method: Direct Push 25-ton Dutch Cone
 Casing Installation Date (INSDATE): 11/10/04
 Well Type (WTCCODE): Monitoring
 Well Completion Method (WCMCODE): Flush
 Geologic Completion Zone (GZCODE): _____



Well Completion

Guard Posts (Y / N) Date: 11/10/04
 Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 8" Steel
 Depth BGS: 6" Weep Hole (Y / N)

Grout

Composition/Proportions: 45 lbs Type II Portland Cement to 5 gallons H₂O
 Placement Method: Tremied through borehole

Seal

Date: 11/10/04
 Type: Bentonite Pre-pack
 Source: Bentonite Pre-pack
 Set-up/Hydration Time: _____
 Placement Method: Pre-pack
 Vol. Fluid Added: NA

Filter Pack

Type: Pre-pack
 Source: Pre-pack
 Amount Used: Pre-pack
 Placement Method: Pre-pack

Well Riser Pipe

Casing Material (CMACODE): PVC
 Casing Inside Diameters (CASDIAM): 3 1/4 7/8 in.

Screen

Material: PVC
 Inside Diameter (SCRDIAM): _____ in.
 Screen Slot Size (SOUA): 0.01 in.
 Percent Open Area (PCTOPEN): _____
 Sump or Bottom Cap (Y / N)
 Type/Length: 2"

Backfill Plug (Y / N)

Material: _____
 Placement Method: _____
 Set-up/Hydration Time: _____

Total Water Volume During Construction

Introduced (Gal): 0 Recovered (Gal): 0

Reviewed

By: [Signature] Date: 11/15/04

Comments



Tetra Tech NUS, Inc.

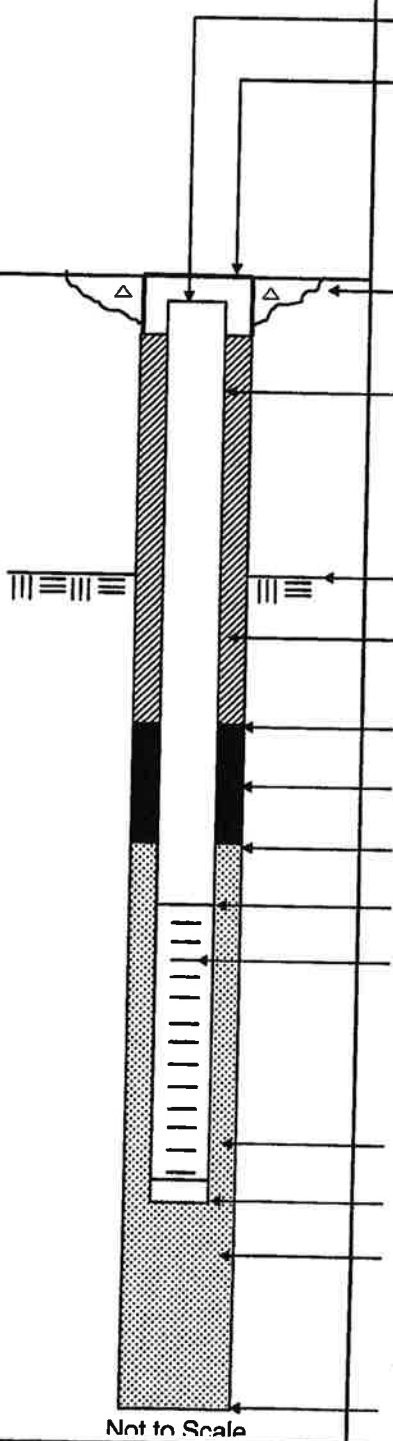
WELL No.:

JW-70D

MONITORING WELL SHEET

PROJECT: CMS DRILLING Co.: DirecTec BORING No.: 0004
 PROJECT No.: N7675-1130 DRILLER: R. Bermudez G. Rezzano MD DATE COMPLETED: 5/16/05
 SITE: LC 34, CCAFS DRILLING METHOD: DPT NORTHING: 463761.64
 GEOLOGIST: Merv Dale DEV. METHOD: Peristaltic Pump EASTING: 242940.52

Ground Elevation = Datum:



Not to Scale

Elevation / Depth of Top of Riser: 13 INCH
 Elevation / Height of Top of Surface Casing: 1 INCH
 I.D. of Surface Casing: 6 INCH
 Type of Surface Casing: Steel bolt-down manhole
 Type of Surface Seal: Concrete
2 ft x 2 ft x 6 inch pad
 I.D. of Riser: 3/4 inch
 Type of Riser: Sch. 40 PVC
 Borehole Diameter: 2 1/2 INCH
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: NATURAL
GROUND
 Elevation / Depth of Seal: N/A
 Type of Seal: N/A
 Elevation / Depth of Top of Filter Pack: 138 FT.
 Elevation / Depth of Top of Screen: 138 FT.
 Type of Screen: Sch. 40 PVC
 Slot Size x Length: 0.010 inch x 5 FT.
 I.D. of Screen: 3/4 inch
 Type of Filter Pack: 20/40 Filter Sand
 Elevation / Depth of Bottom of Screen: 143 FT.
 Elevation / Depth of Bottom of Filter Pack: 143 ft.
 Type of Backfill Below Well: NATURAL GROUND
 Elevation / Total Depth of Borehole: 143 ft.



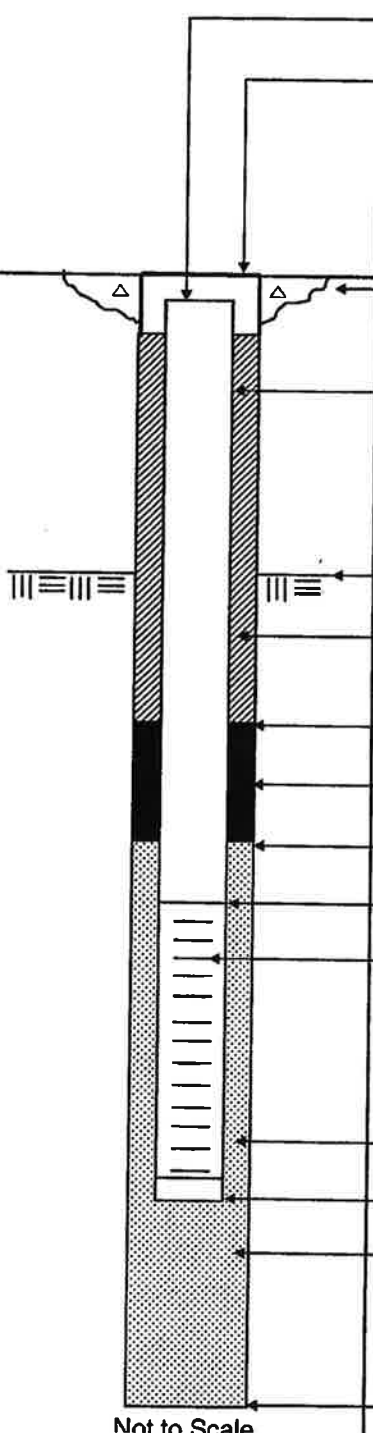
Tetra Tech NUS, Inc.

WELL No.: IW-7001

MONITORING WELL SHEET

PROJECT:	<u>CMS</u>	DRILLING Co.:	<u>Preferred</u>	BORING No.:	<u>019</u>
PROJECT No.:	<u>N1130</u>	DRILLER:	<u>Jon K.</u>	DATE COMPLETED:	<u>06/27/05</u>
SITE:	<u>LC34, CCAFS</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>463756.64</u>
GEOLOGIST:	<u>Merv Dale</u>	DEV. METHOD:	<u>Peristaltic</u>	EASTING:	<u>242940.52</u>

Ground Elevation = Datum:



Not to Scale

Elevation / Depth of Top of Riser:	<u>1 INCH</u>
Elevation / Height of Top of Surface Casing:	<u>1 INCH</u>
I.D. of Surface Casing:	<u>8 inches</u>
Type of Surface Casing:	<u>Steel bolt-down manhole</u>
Type of Surface Seal:	<u>Concrete</u>
	<u>2'x2'x6" PAD</u>
I.D. of Riser:	<u>3/4 inch</u>
Type of Riser:	<u>Sch. 40 PVC</u>
Borehole Diameter:	<u>2 1/8 inches</u>
Elevation / Depth Top of Rock:	<u>NA</u>
Type of Backfill:	<u>Type I/II Portland cement</u>
Elevation / Depth of Seal:	<u>1.60 FT.</u>
Type of Seal:	<u>NATIVE SOIL</u>
Elevation / Depth of Top of Filter Pack:	<u>1.65 FT.</u>
Elevation / Depth of Top of Screen:	<u>1.65 FT.</u>
Type of Screen:	<u>Sch. 40 PVC</u>
Slot Size x Length:	<u>0.010 inch x 10 ft.</u>
I.D. of Screen:	<u>3/4 inch</u>
Type of Filter Pack:	<u>30/45 GRADE SAND</u>
Elevation / Depth of Bottom of Screen:	<u>1.75 FT.</u>
Elevation / Depth of Bottom of Filter Pack:	<u>1.75 FT.</u>
Type of Backfill Below Well:	<u>NATIVE SOIL</u>
Elevation / Total Depth of Borehole:	<u>175 FT.</u>



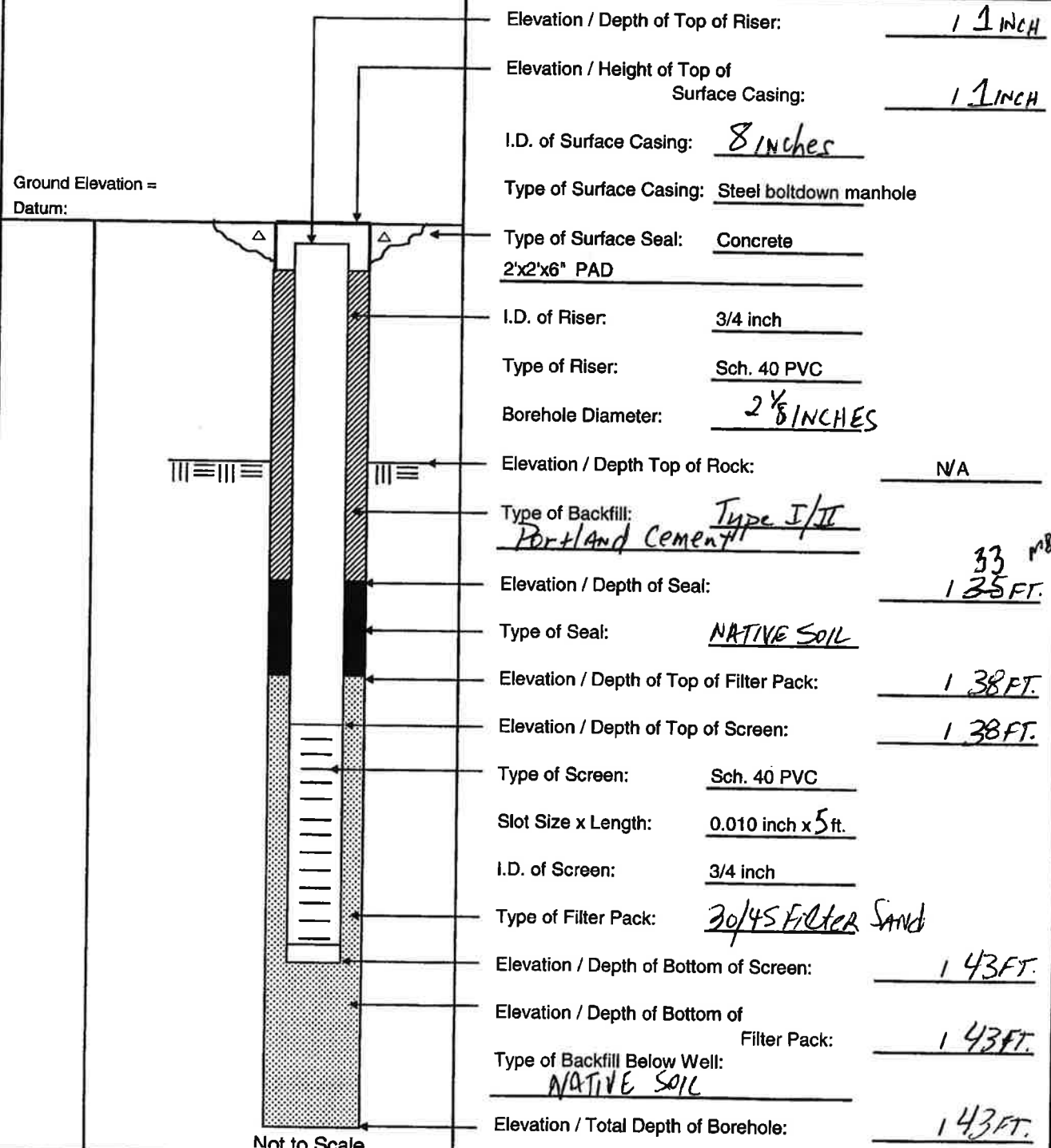
Tetra Tech NUS, Inc.

WELL No.:

IW- 71D

MONITORING WELL SHEET

PROJECT:	<u>CMS</u>	DRILLING Co.:	<u>Preferred</u>	BORING No.:	<u>022</u>
PROJECT No.:	<u>N1130</u>	DRILLER:	<u>Jon K.</u>	DATE COMPLETED:	<u>06/28/05</u>
SITE:	<u>LC34, CCAFS</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>463668.84</u>
GEOLOGIST:	<u>Merv Dale</u>	DEV. METHOD:	<u>Peristaltic</u>	EASTING:	<u>242899.13</u>



Elevation / Depth of Top of Riser:	<u>1.1 INCH</u>
Elevation / Height of Top of Surface Casing:	<u>1.1 INCH</u>
I.D. of Surface Casing:	<u>8 inches</u>
Type of Surface Casing:	<u>Steel bolt-down manhole</u>
Type of Surface Seal:	<u>Concrete</u>
<u>2'x2'x6" PAD</u>	
I.D. of Riser:	<u>3/4 inch</u>
Type of Riser:	<u>Sch. 40 PVC</u>
Borehole Diameter:	<u>2 1/8 INCHES</u>
Elevation / Depth Top of Rock:	<u>NA</u>
Type of Backfill:	<u>Type I/II Portland Cement</u>
Elevation / Depth of Seal:	<u>33 MB 1.25 FT.</u>
Type of Seal:	<u>NATIVE SOIL</u>
Elevation / Depth of Top of Filter Pack:	<u>1.38 FT.</u>
Elevation / Depth of Top of Screen:	<u>1.38 FT.</u>
Type of Screen:	<u>Sch. 40 PVC</u>
Slot Size x Length:	<u>0.010 inch x 5 ft.</u>
I.D. of Screen:	<u>3/4 inch</u>
Type of Filter Pack:	<u>30/45 FILTER SAND</u>
Elevation / Depth of Bottom of Screen:	<u>1.43 FT.</u>
Elevation / Depth of Bottom of Filter Pack:	<u>1.43 FT.</u>
Type of Backfill Below Well:	<u>NATIVE SOIL</u>
Elevation / Total Depth of Borehole:	<u>1.43 FT.</u>



Tetra Tech NUS, Inc.

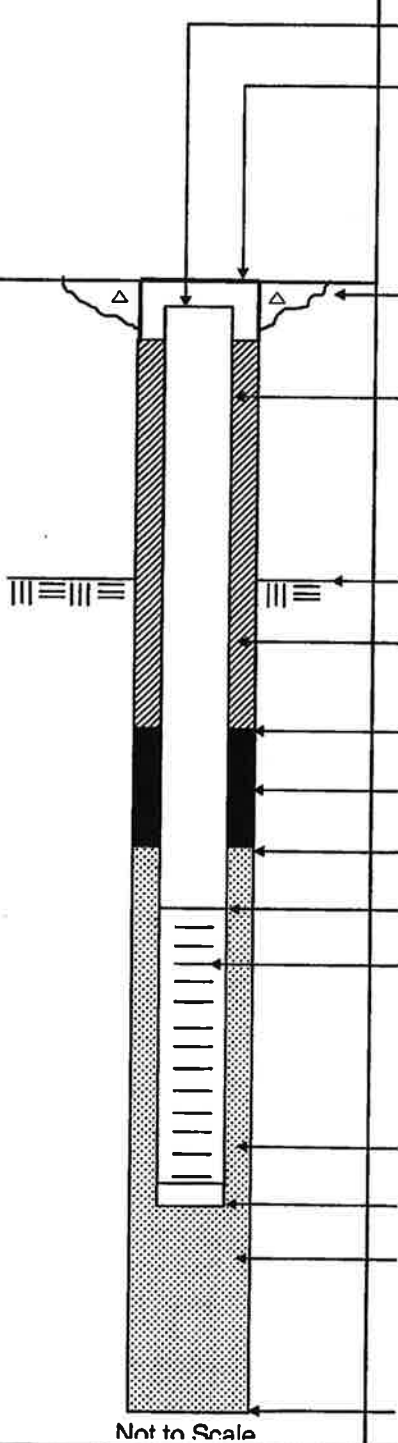
WELL No.:

IW- 71D1

MONITORING WELL SHEET

PROJECT:	<u>CMS</u>	DRILLING Co.:	<u>Preferred</u>	BORING No.:	<u>021</u>
PROJECT No.:	<u>N1130</u>	DRILLER:	<u>JON K.</u>	DATE COMPLETED:	<u>06/28/05</u>
SITE:	<u>LC34, CCAFS</u>	DRILLING METHOD:	<u>DPT</u>	NORTHING:	<u>463 663.84</u>
GEOLOGIST:	<u>Merv Dale</u>	DEV. METHOD:	<u>Peristaltic</u>	EASTING:	<u>242899.13</u>

Ground Elevation = Datum:



Not to Scale

Elevation / Depth of Top of Riser:	<u>1 1 INCH</u>
Elevation / Height of Top of Surface Casing:	<u>1 1 INCH</u>
I.D. of Surface Casing:	<u>8 inches</u>
Type of Surface Casing:	<u>Steel bolt-down manhole</u>
Type of Surface Seal:	<u>Concrete</u>
	<u>2'x2'x6" PAD</u>
I.D. of Riser:	<u>3/4 inch</u>
Type of Riser:	<u>Sch. 40 PVC</u>
Borehole Diameter:	<u>2 1/8 inches</u>
Elevation / Depth Top of Rock:	<u>NA</u>
Type of Backfill:	<u>Type I and II PORTLAND CEMENT</u>
Elevation / Depth of Seal:	<u>1 60 FT.</u>
Type of Seal:	<u>NATIVE SOIL</u>
Elevation / Depth of Top of Filter Pack:	<u>1 65 FT.</u>
Elevation / Depth of Top of Screen:	<u>1 65 FT.</u>
Type of Screen:	<u>Sch. 40 PVC</u>
Slot Size x Length:	<u>0.010 inch x 10 ft.</u>
I.D. of Screen:	<u>3/4 inch</u>
Type of Filter Pack:	<u>30/45 GRADE SAND</u>
Elevation / Depth of Bottom of Screen:	<u>1 75 FT.</u>
Elevation / Depth of Bottom of Filter Pack:	<u>1 75 FT.</u>
Type of Backfill Below Well:	<u>NATIVE SOIL</u>
Elevation / Total Depth of Borehole:	<u>1 75 FT.</u>

**WELL CONSTRUCTION LOG
STANDARD FLUSH MOUNT**

Well I.D.: IW0076

Site: LC34

Drilling Company: Groundwater Protection

Project Number: F00552B

Drillers: Scott/Bill Niles

Installation Method: Sonic

Geologist/Engineer: R Daprato

Casing Installation Date: 7/16/2009

Signature: _____

Well Type: Monitoring Well

Well Completion Method: Flush

Geologic Completion Zone: Surficial

Well Completion

Guard Posts (Y / (N)) Date: 7/16/2009

Surface Pad Size: 3 ft x 3 ft

Protective Casing or Cover

Diameter/Type: 8-inch manhole

Depth BGS: ~9" Weep Hole (Y / (N))

Grout

Composition/Proportions: Holcolm ASTM Type GU Portland Cement

Placement Method: Direct Pour

Seal

Date: 07/16/2009

Type: sand 30/65

Source: Standard sand

Set-up/Hydration Time: N/A

Placement Method: Direct pour

Vol. Fluid Added: None

Filter Pack

Type: Standard sand 20/30

Source: standard sand

Amount Used: four- 50 lb bags

Placement Method: direct pour

Well Riser Pipe

Casing Material: PVC SCH 40

Casing Inside Diameters: 2 in.

Screen

Material: PVC SCH 40

Inside Diameter: 2 in.

Screen Slot Size: 0.010 in.

Percent Open Area:

Sump or Bottom Cap (Y / (N))

Type/Length: 10 ft

Backfill Plug (Y / (N))

Material:

Placement Method:

Set-up/Hydration Time:

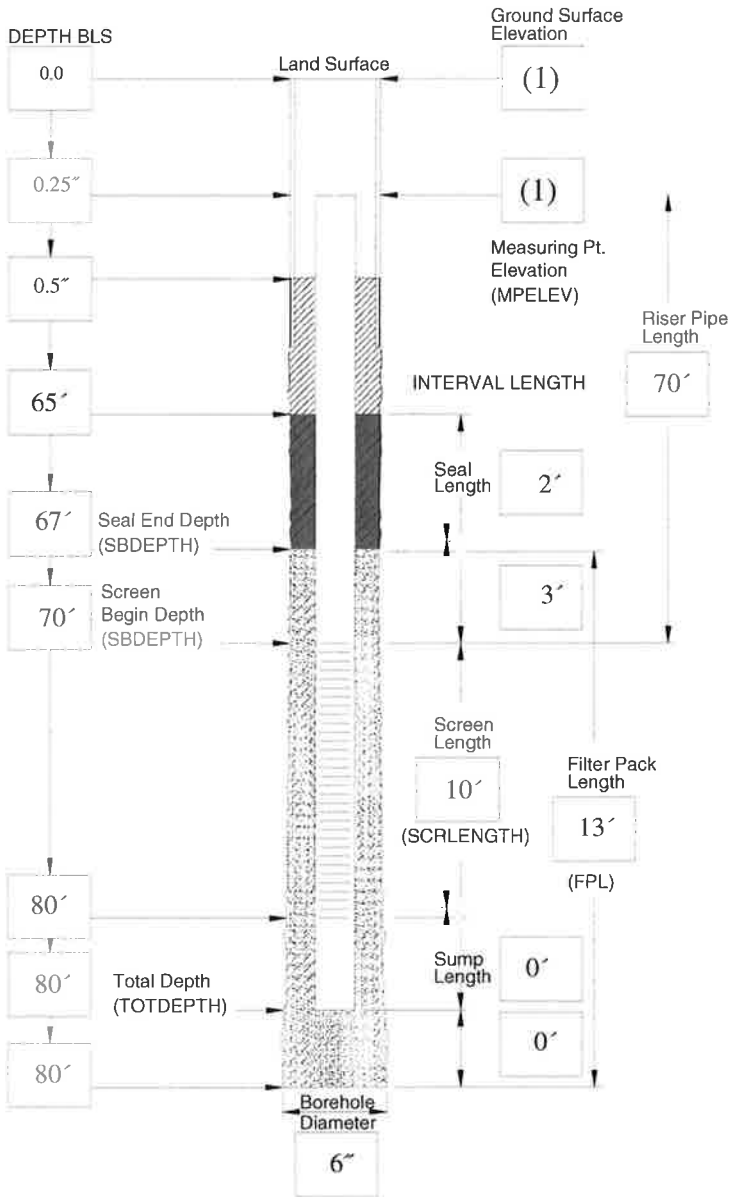
Total Water Volume During Construction

Introduced (Gal): 0

Recovered (Gal): 6

Reviewed

By: _____ Date: _____



Comments

(1) Not vet surveyed

ATTACHMENT B-2
HYDRAULIC CONDUCTIVITY TEST RESULTS

**ATTACHMENT B-2
SUMMARY OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD**

INTERMEDIATE			
Well ID (screen interval, ft BLS)		K-Value (ft/d)	
IJ0017 (32-42)	1	8.7	
	2	9.1	
	3	9.1	
	4	10.3	
IJ0021 (32-42)	1	3.5	
	2	4.3	
	3	4.2	
RW0007 (34-41)	1	4.9	
	2	4.8	
	3	*	
Average		6.6	

DEEP			
Well ID (screen interval, ft BLS)		K-Value (ft/d)	
IJ0018 (47-57)	1	4.2	
	2	4.6	
	3	4.1	
IJ0022 (47-57)	1	5.5	
	2	5.5	
	3	3.7	
RW0008 (47-57)	1	*	
	2	3.8	
	3	*	
	4	4.4	
Average		4.5	

* Data was poorly correlated (not log-linear)

Notes

ft BLS - feet below land surface

ft/d - feet per day

K - hydraulic conductivity

Typical K Values

- clean gravel 1.0 to 10² cm/s (2,800 to 280,000 ft/d)
- clean sands 10⁻³ to 1.0 cm/s (2.8 to 2,800 ft/d)
- very fine sands, organic and inorganic silts, mixtures of sand, silt and clay, glacial till, stratified clay deposits, etc 10⁻⁷ to 10⁻³ cm/s (2.8x10⁻⁴ to 2.8 ft/d)

Source: *An Introduction to Geotechnical Engineering* Robert D. Holtz,

William D. Kovacs, Prentice-Hall Inc, NJ 1981

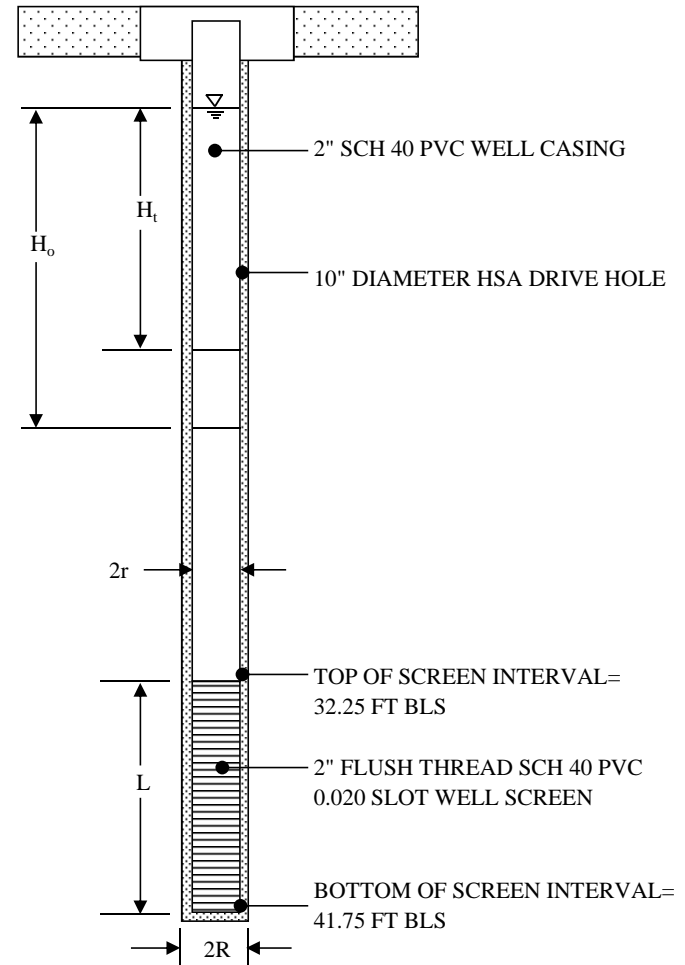
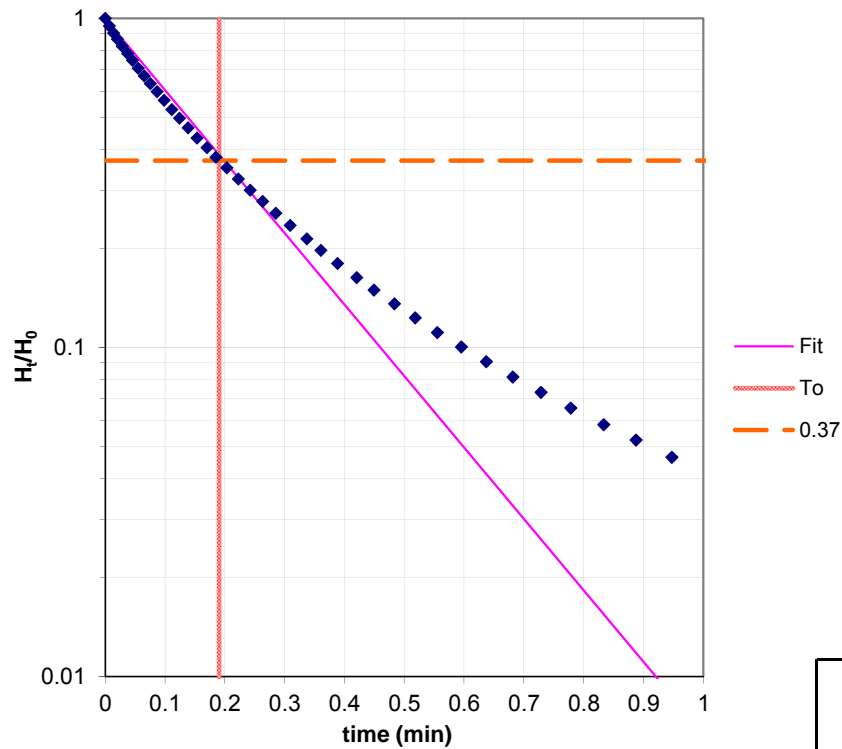
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

- H_0 (ft) = 5.8128 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.19
- m = -5 Slope of Fit Line

K (ft/day) = 8.7 Hydraulic Conductivity



**IJ0017
(Test 1)**

DATE 2/15/2011
PROJECT NO. ER-0716

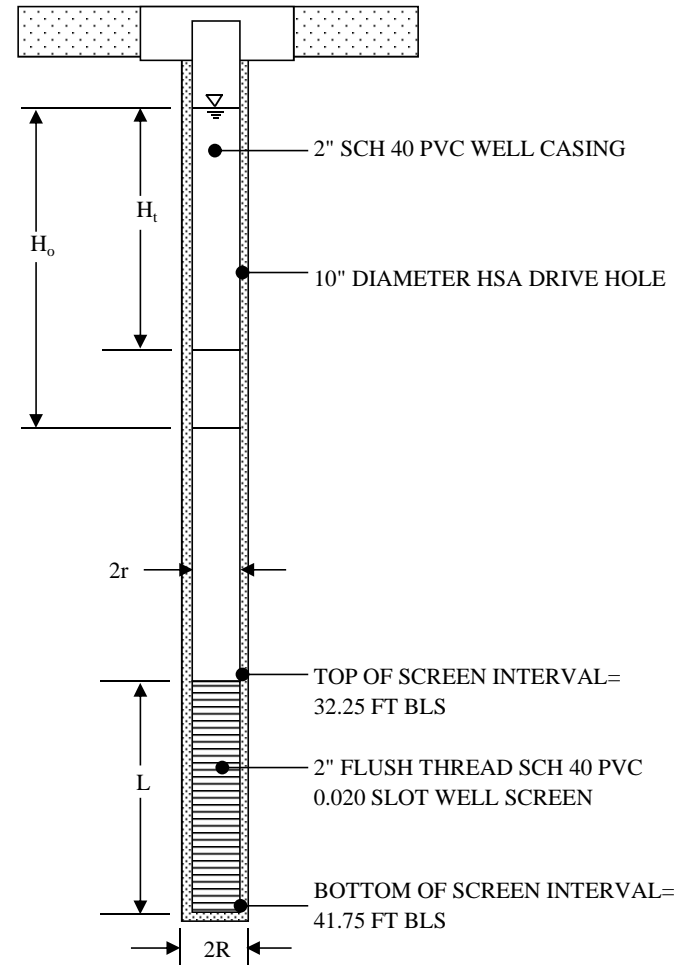
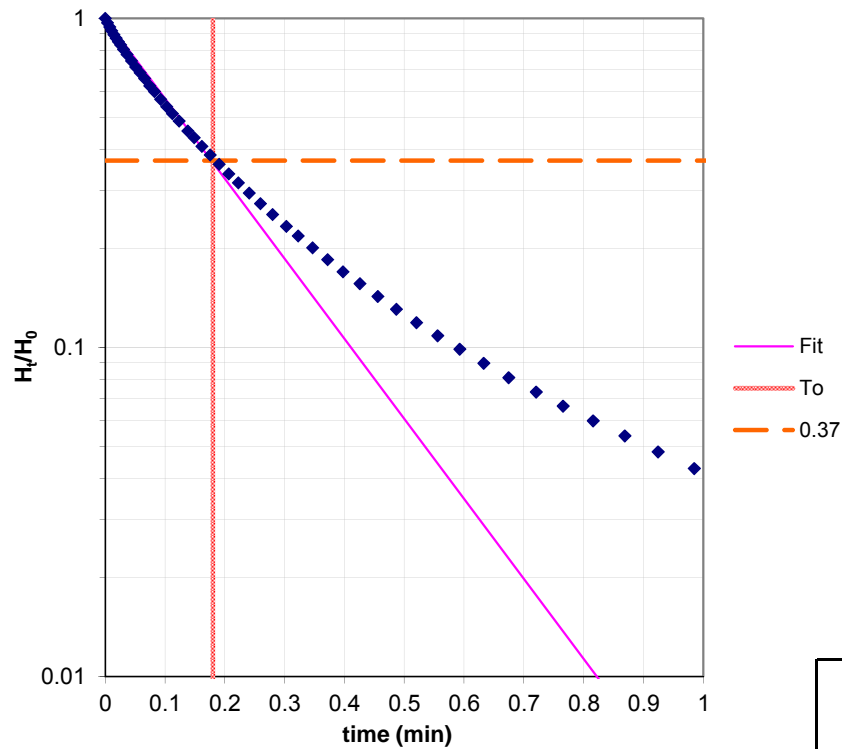
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2L T_0}$$

- H_0 (ft) = 5.6974 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.18
- m = -5.6 Slope of Fit Line

K (ft/day) = 9.1 Hydraulic Conductivity



**IJ0017
(Test 2)**

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2L T_0}$$

H_0 (ft) = 4.1128 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

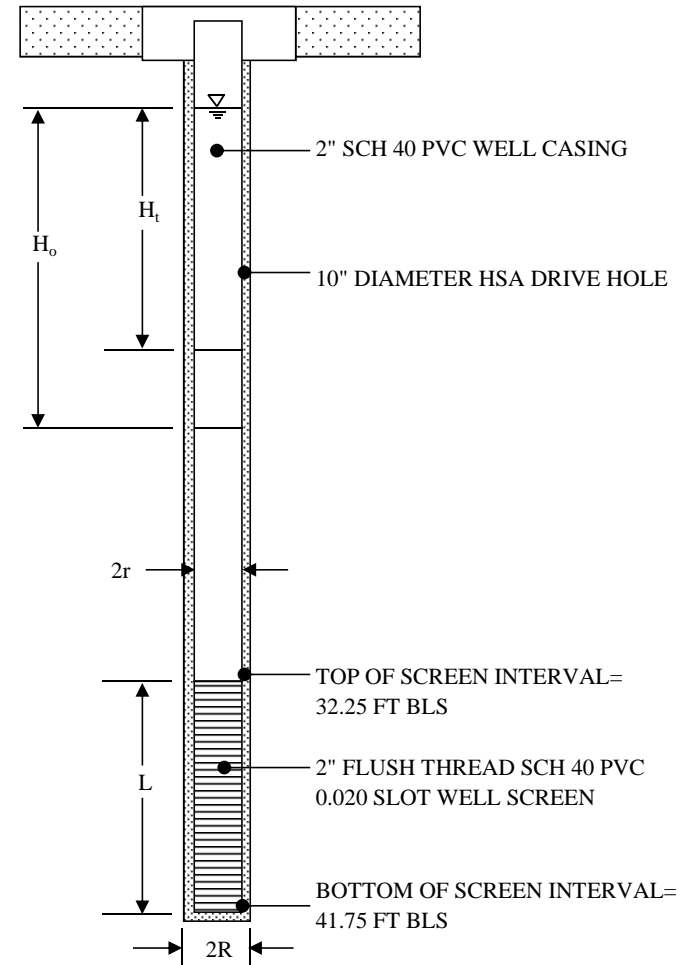
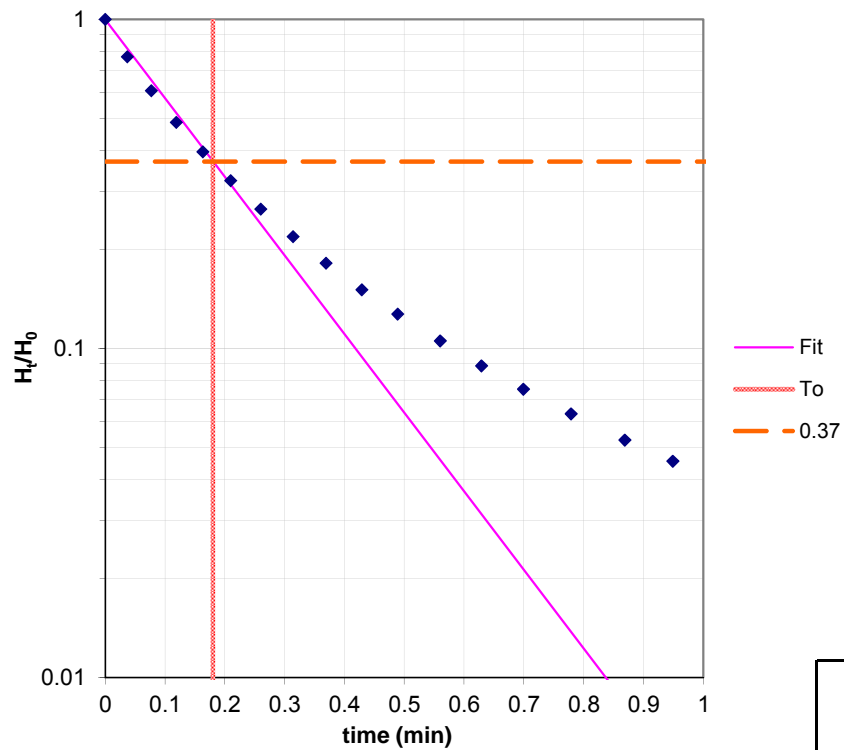
L (ft) = 9.5 Length of the screened interval

L/R = 22.8

T_0 (min) = 0.18

m = -5.5 Slope of Fit Line

K (ft/day) = 9.1 Hydraulic Conductivity



**IJ0017
(Test 3)**

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2L T_0}$$

H_0 (ft) = 0.7335 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

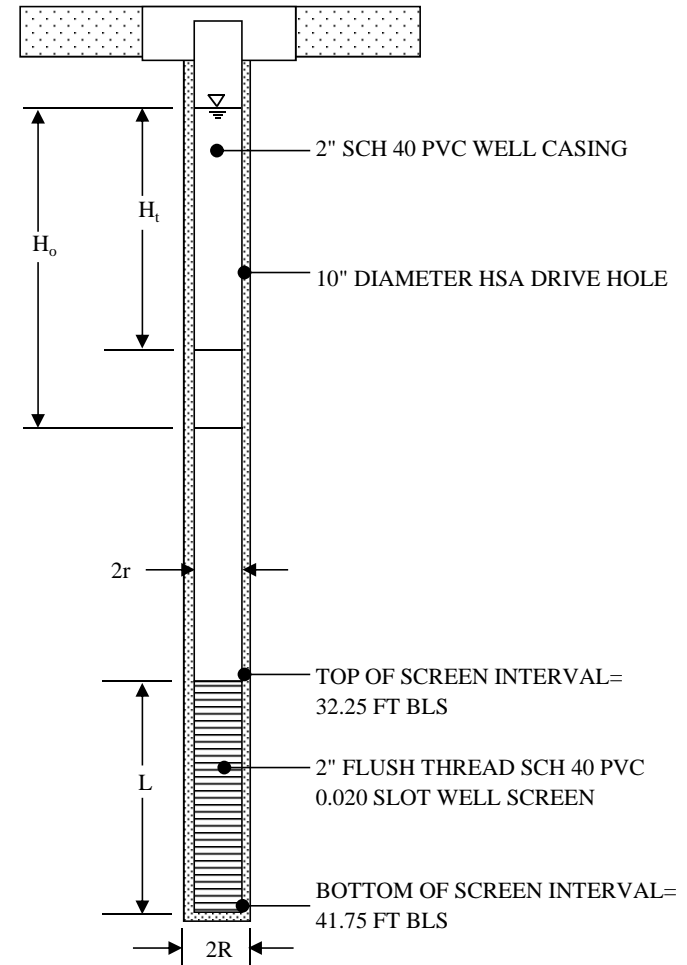
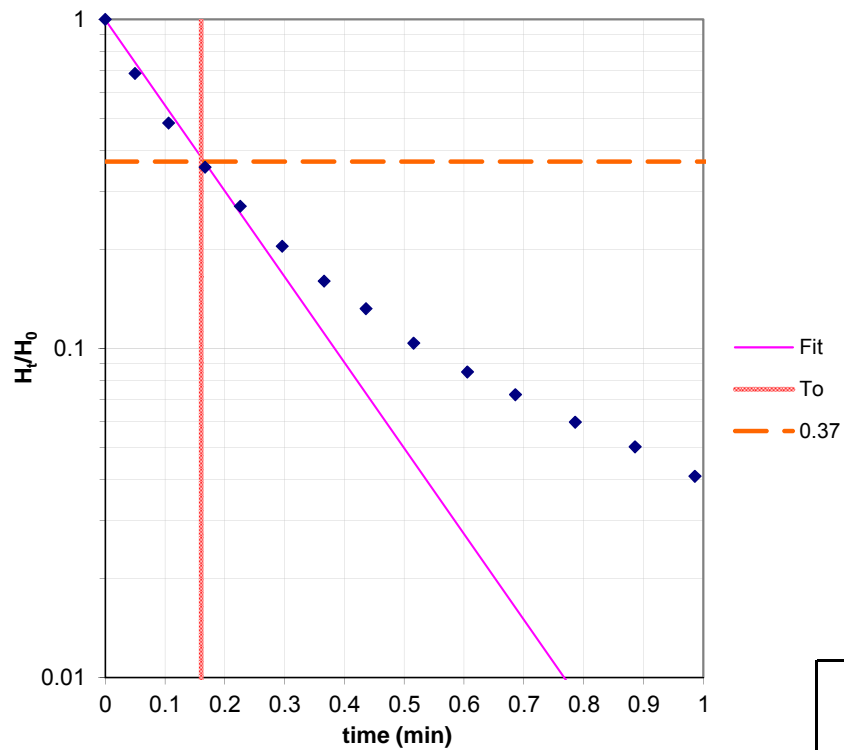
L (ft) = 9.5 Length of the screened interval

L/R = 22.8

T_0 (min) = 0.16

m = -6 Slope of Fit Line

K (ft/day) = 10.3 Hydraulic Conductivity



DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2L T_0}$$

H_0 (ft) = 1.7369 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

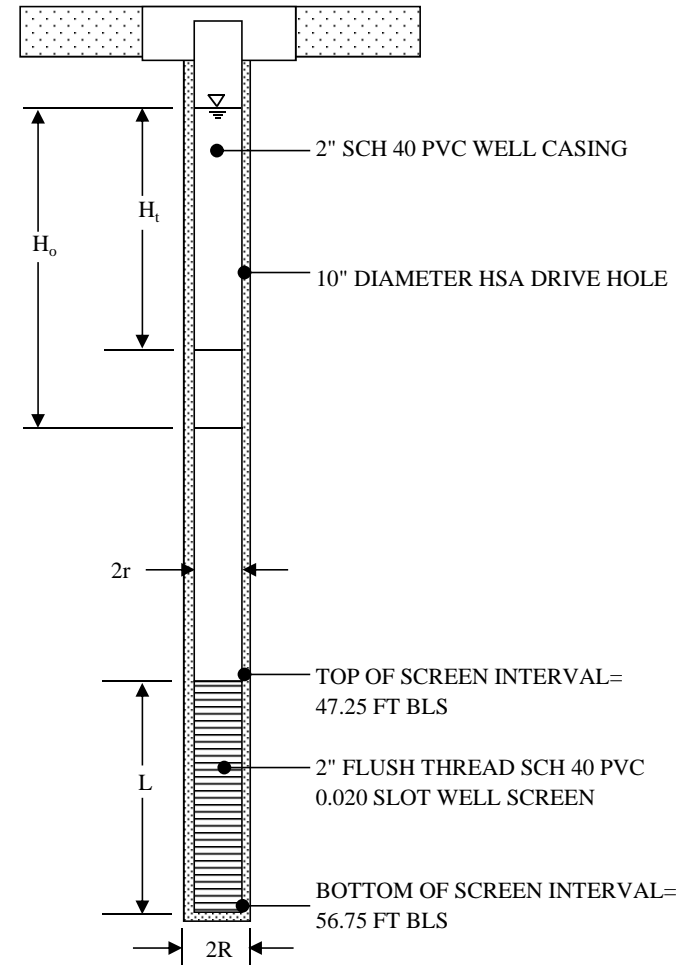
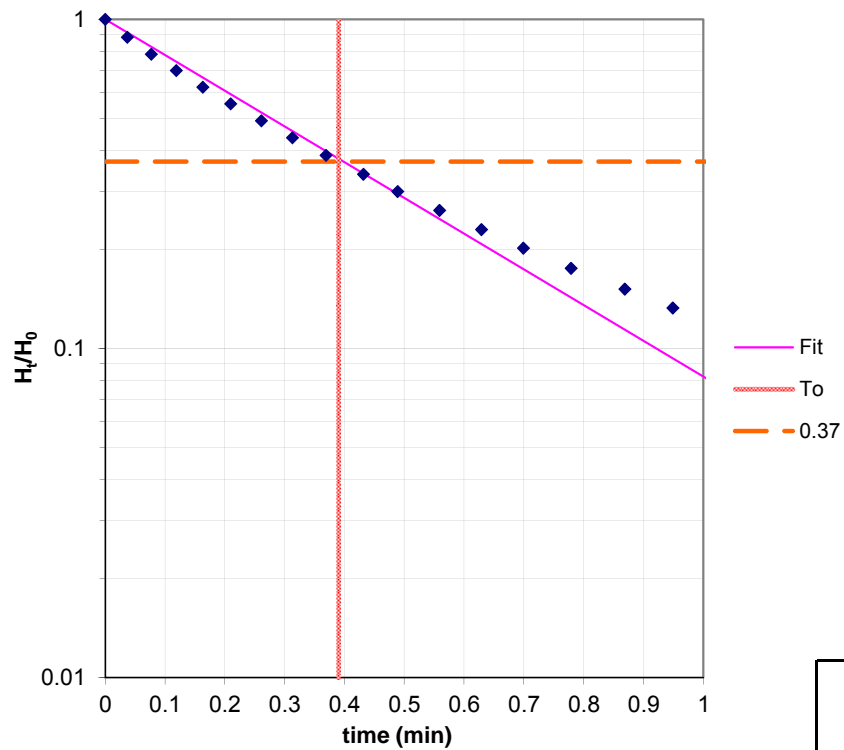
L (ft) = 9.5 Length of the screened interval

L/R = 22.8

T_0 (min) = 0.39

m = -2.5 Slope of Fit Line

K (ft/day) = 4.2 Hydraulic Conductivity



IJ0018
(Test 1)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.6897 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

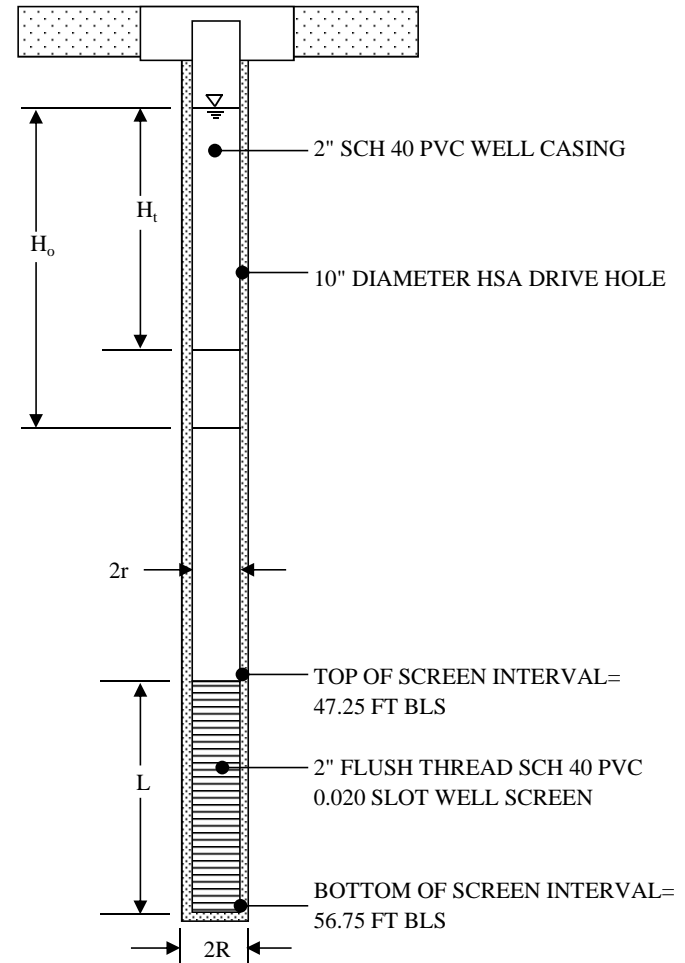
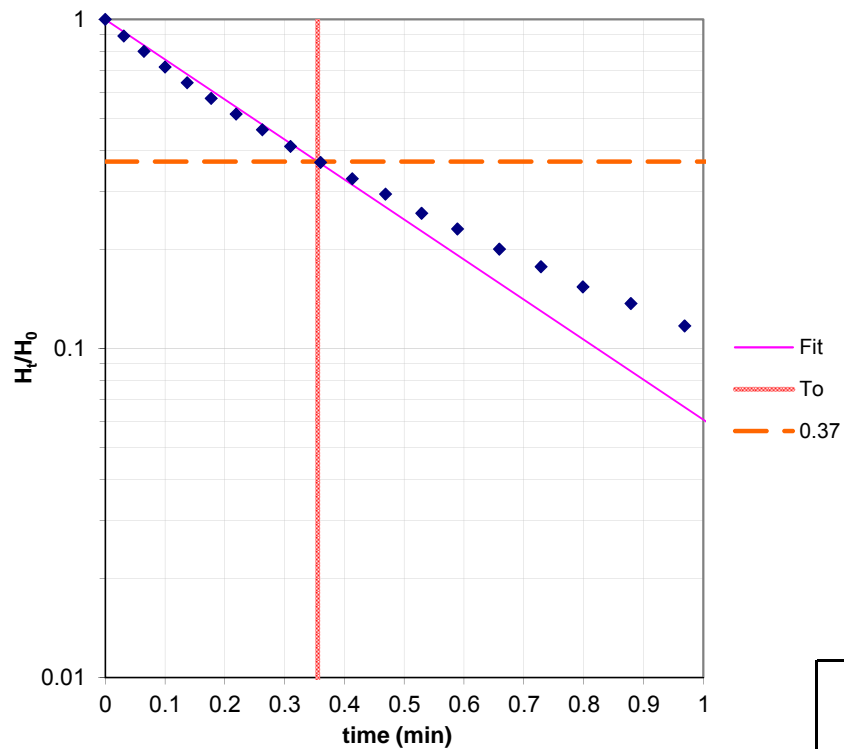
L (ft) = 9.5 Length of the screened interval

L/R = 22.8

T_0 (min) = 0.355

m = -2.8 Slope of Fit Line

K (ft/day) = 4.6 Hydraulic Conductivity



IJ0018
(Test 2)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 1.3632 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

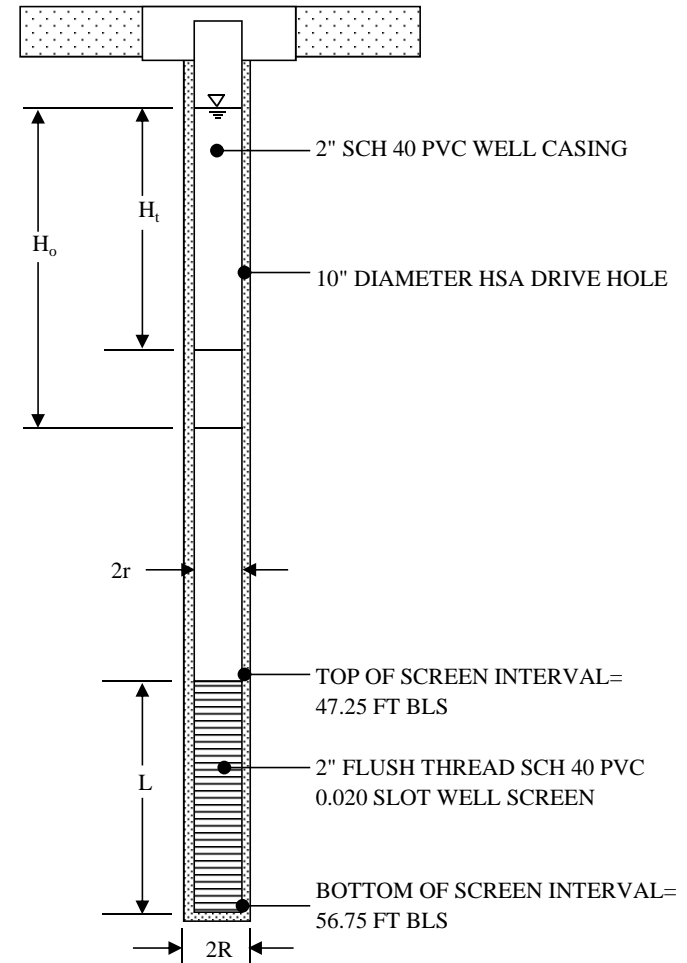
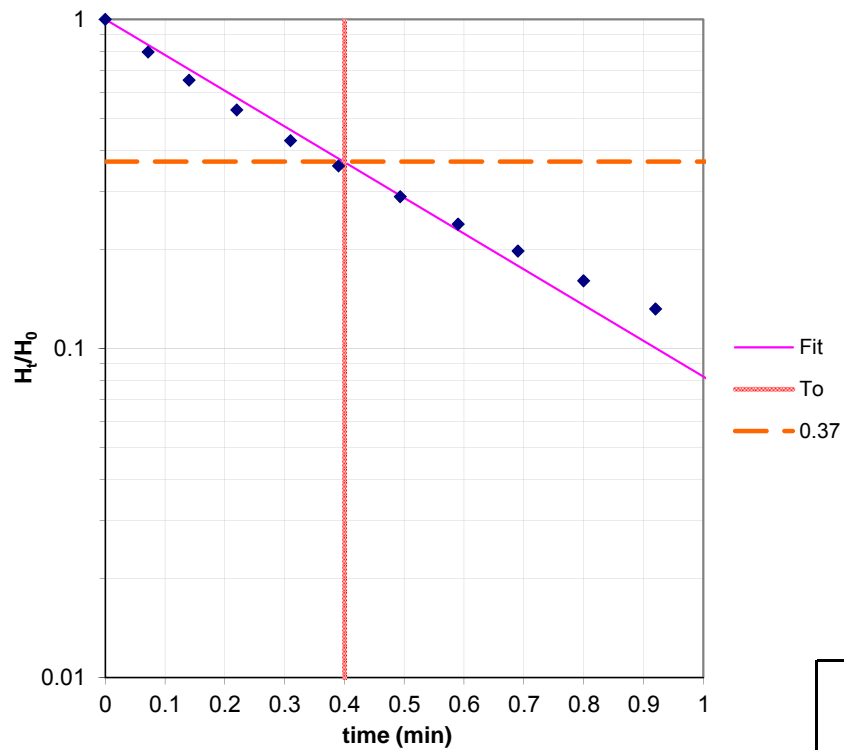
L (ft) = 9.5 Length of the screened interval

L/R = 22.8

T_0 (min) = 0.4

m = -2.5 Slope of Fit Line

K (ft/day) = 4.1 Hydraulic Conductivity



IJ0018
(Test 3)

DATE 2/15/2011
PROJECT NO. ER-0716

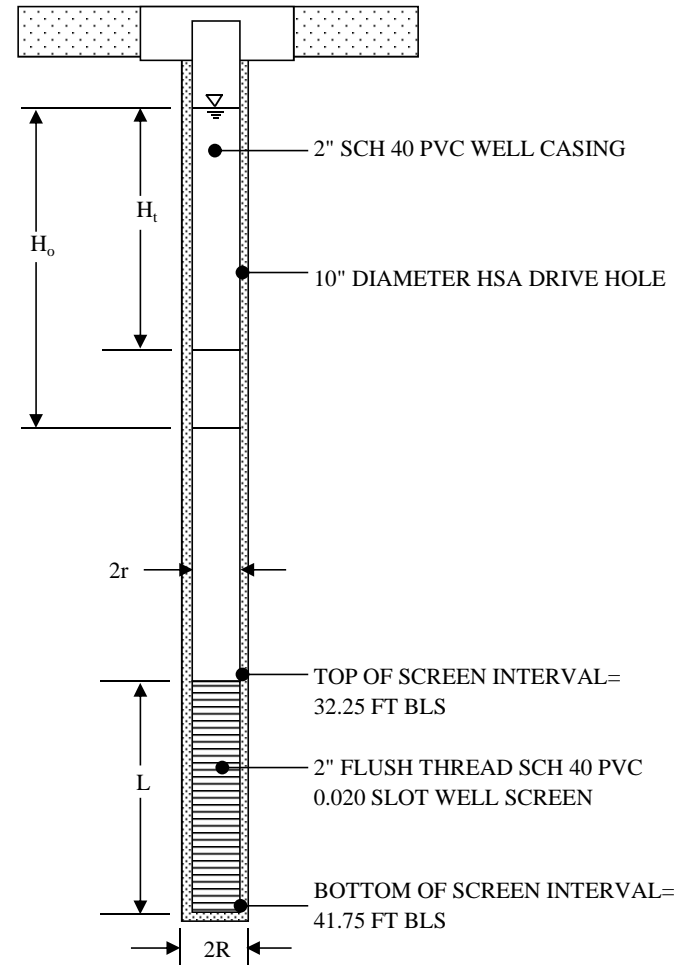
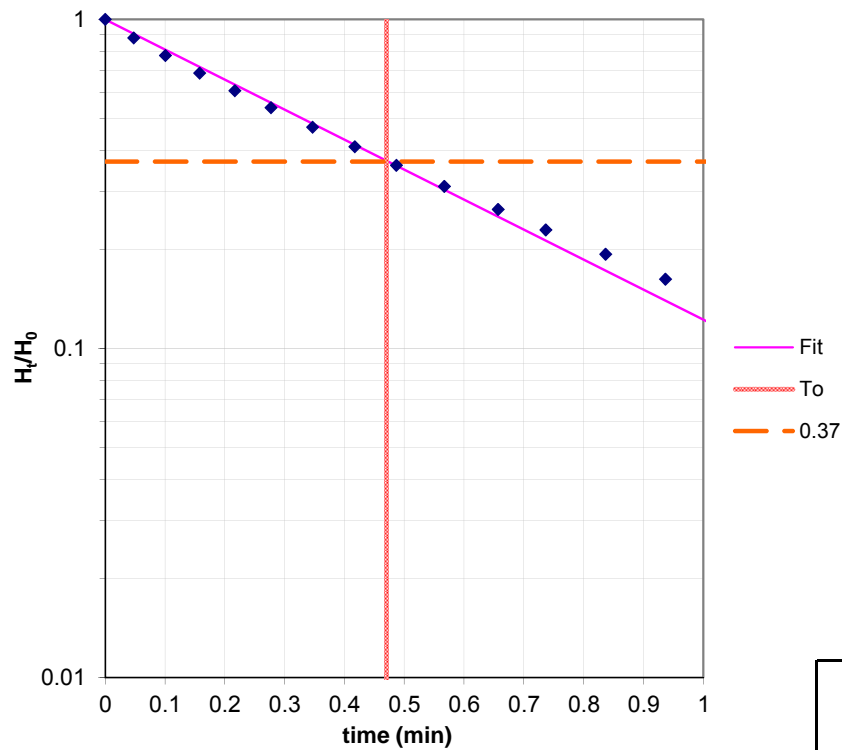
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2L T_0}$$

- H_0 (ft) = 2.2421 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.47
- m = -2.1 Slope of Fit Line

K (ft/day) = 3.5 Hydraulic Conductivity



**IJ0021
(Test 1)**

DATE 2/15/2011
PROJECT NO. ER-0716

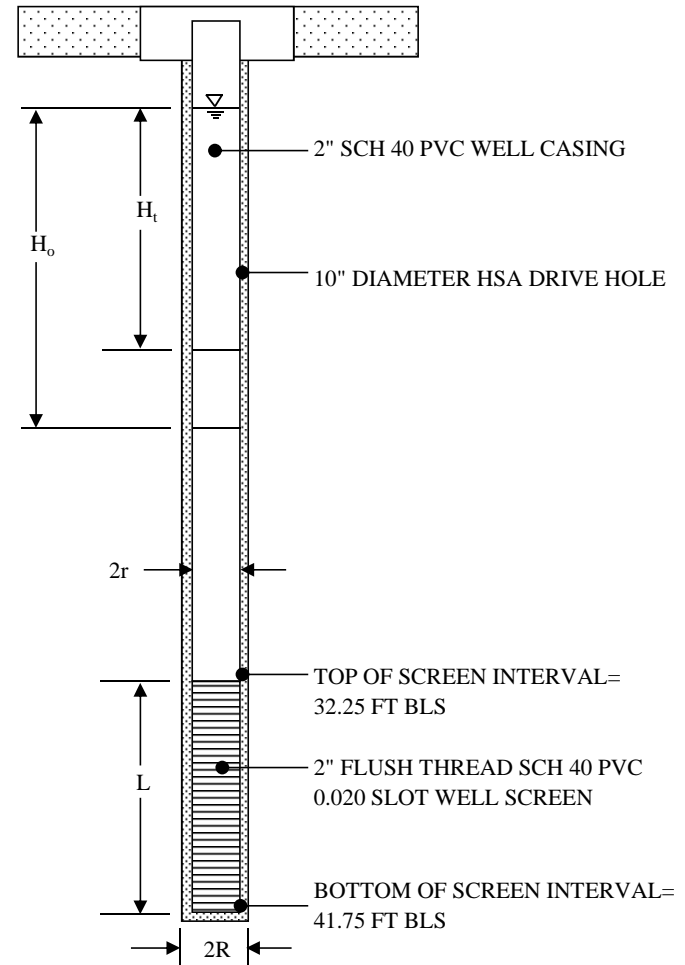
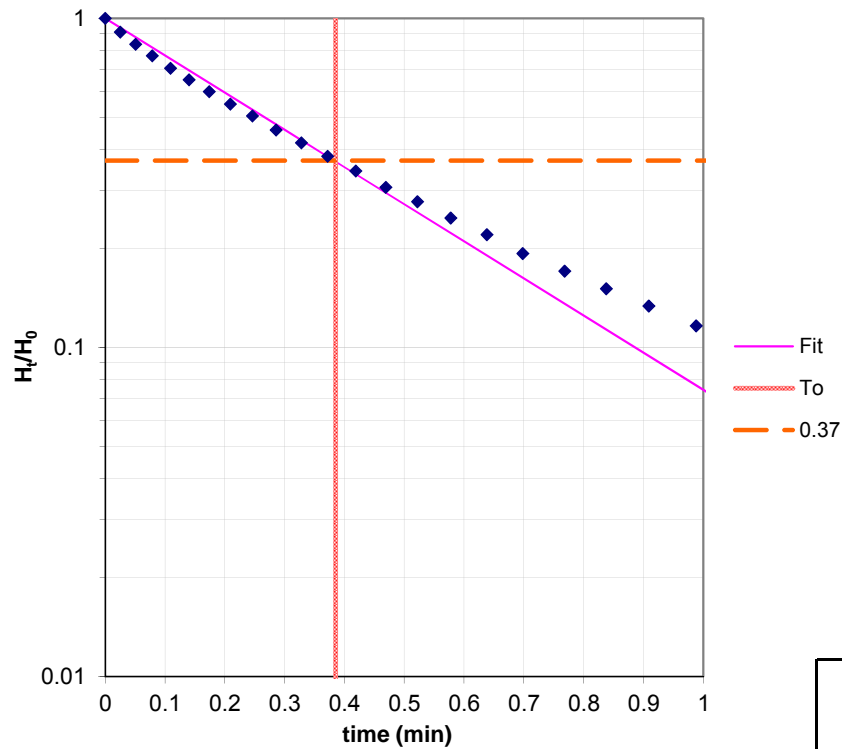
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

- H_0 (ft) = 0.9319 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.385
- m = -2.6 Slope of Fit Line

K (ft/day) = 4.3 Hydraulic Conductivity



**IJ0021
(Test 2)**

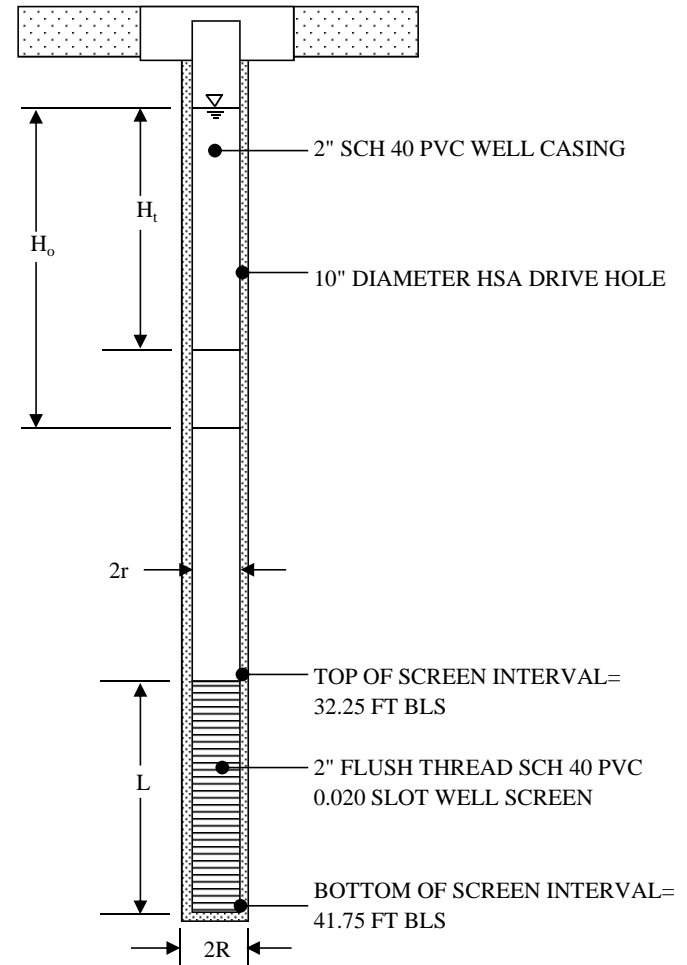
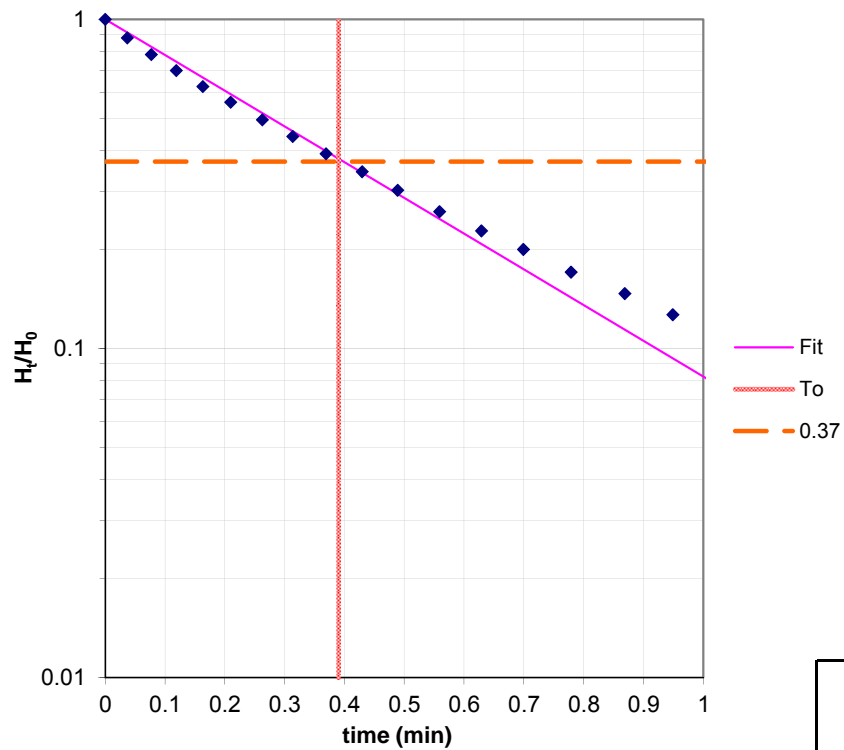
DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:
$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

- H_0 (ft) = 1.2571 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.39
- m = -2.5 Slope of Fit Line

K (ft/day) = 4.2 Hydraulic Conductivity



**IJ0021
(Test 3)**

DATE 2/15/2011
PROJECT NO. ER-0716

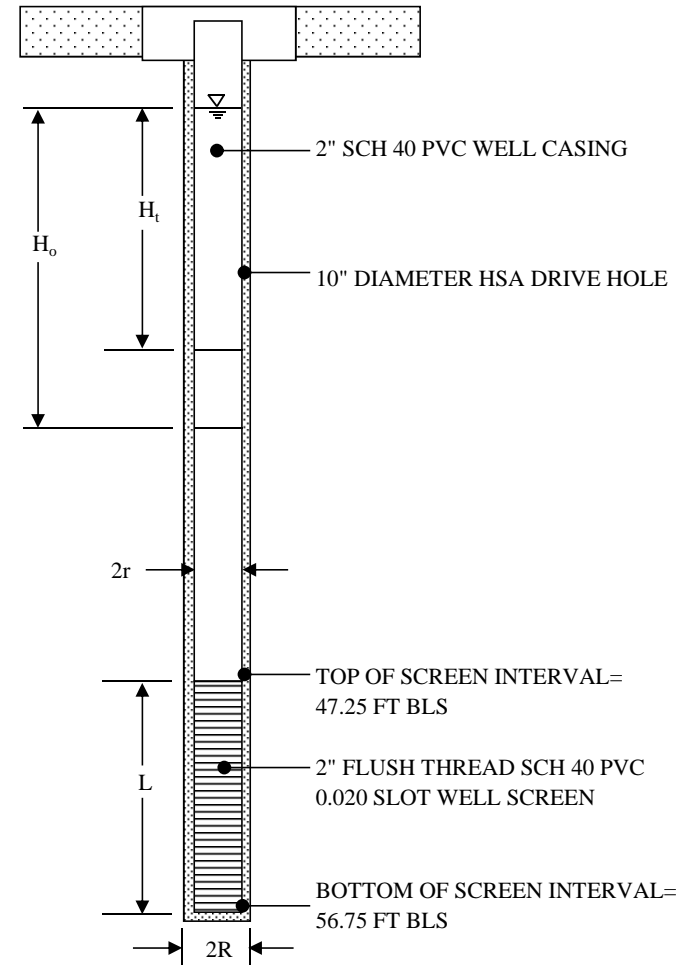
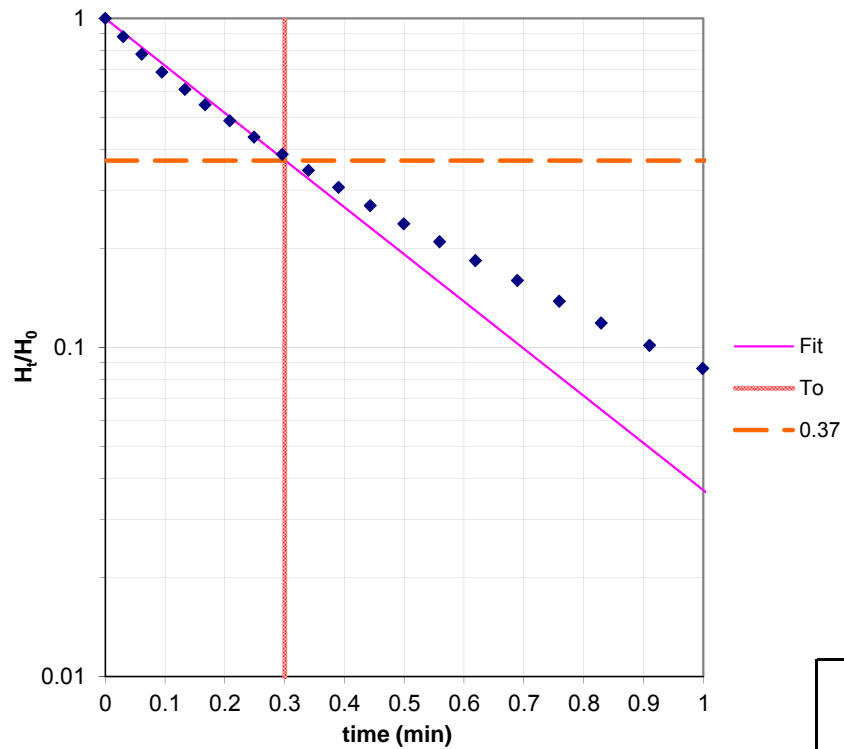
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

- H_0 (ft) = 1.068 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.3
- m = -3.3 Slope of Fit Line

K (ft/day) = 5.5 Hydraulic Conductivity



**IJ0022
(Test 1)**

DATE 2/15/2011
PROJECT NO. ER-0716

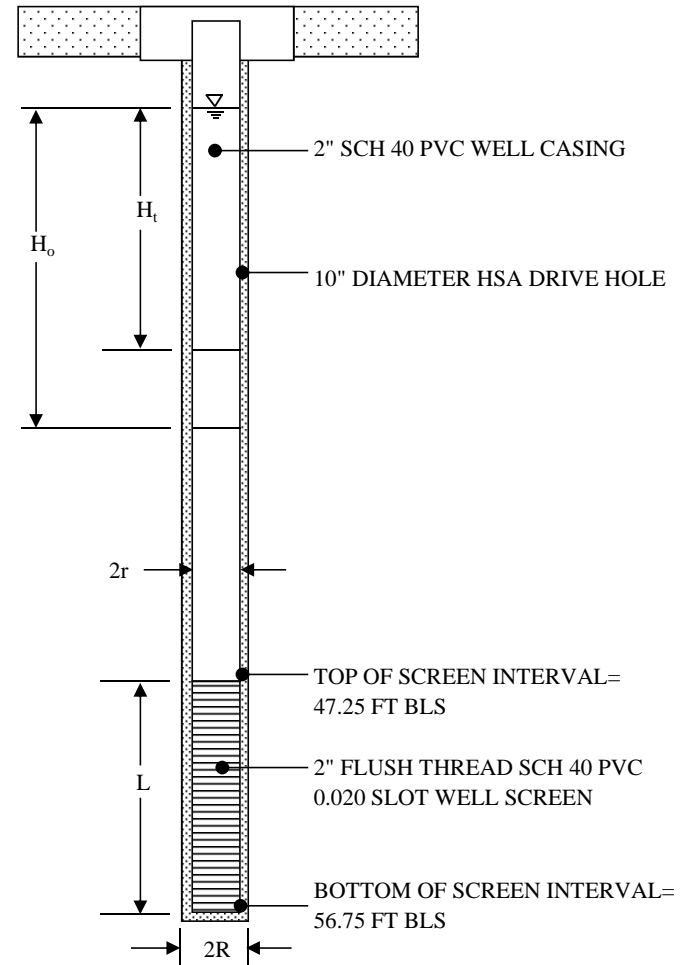
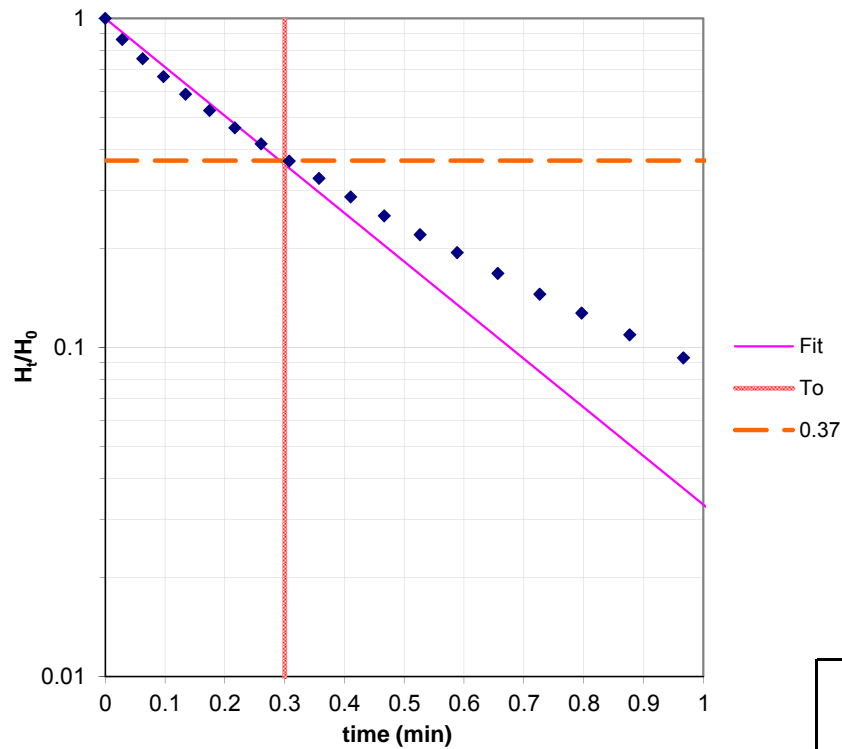
EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

- H_0 (ft) = 1.414 Maximum distance below static water level
- H_t (ft) = varies Distance below static water table at time = t
- r (ft) = 0.083 Radius of the well casing
- R (ft) = 0.417 Radius of the borehole
- L (ft) = 9.5 Length of the screened interval
- L/R = 22.8
- T_0 (min) = 0.3
- m = -3.4 Slope of Fit Line

K (ft/day) = 5.5 Hydraulic Conductivity



**IJ0022
(Test 1)**

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 2.9318 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.083 Radius of the well casing

R (ft) = 0.417 Radius of the borehole

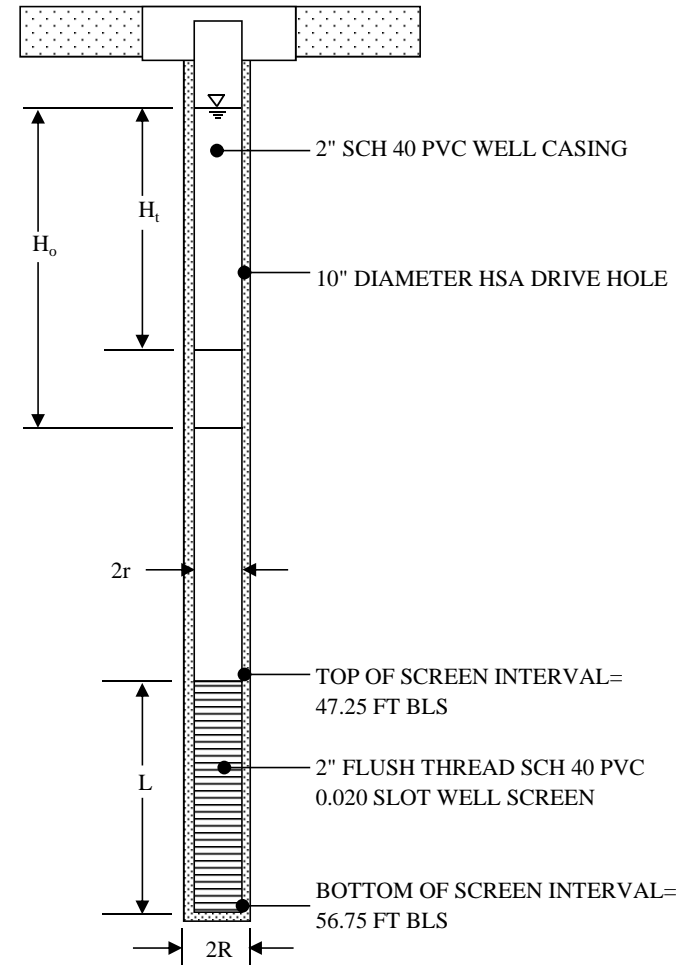
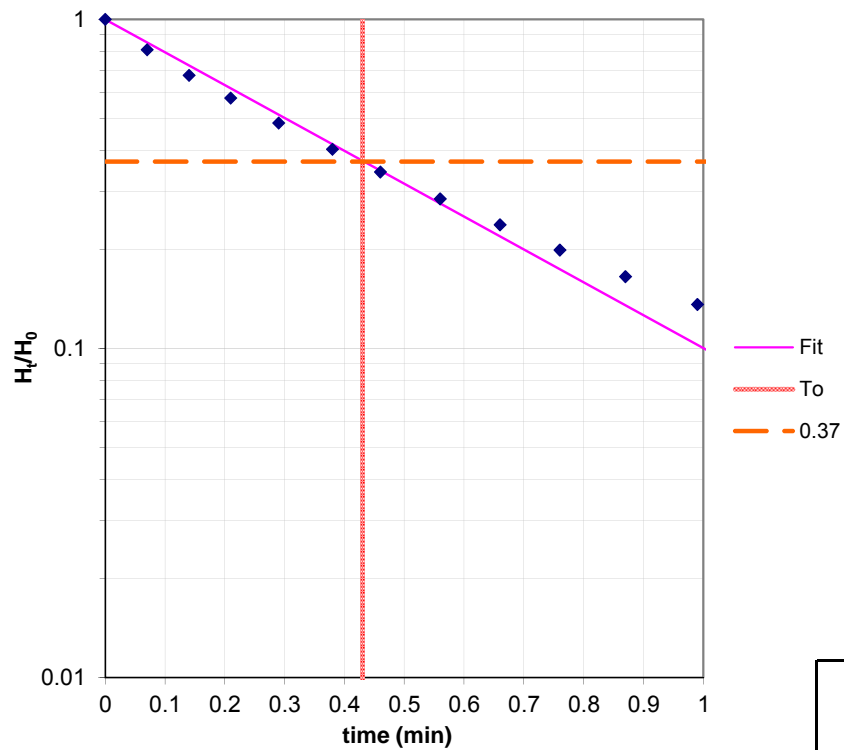
L (ft) = 10 Length of the screened interval

L/R = 24

T_0 (min) = 0.43

m = -2.3 Slope of Fit Line

K (ft/day) = 3.7 Hydraulic Conductivity



**IJ0022
(Test 3)**

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.5905 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

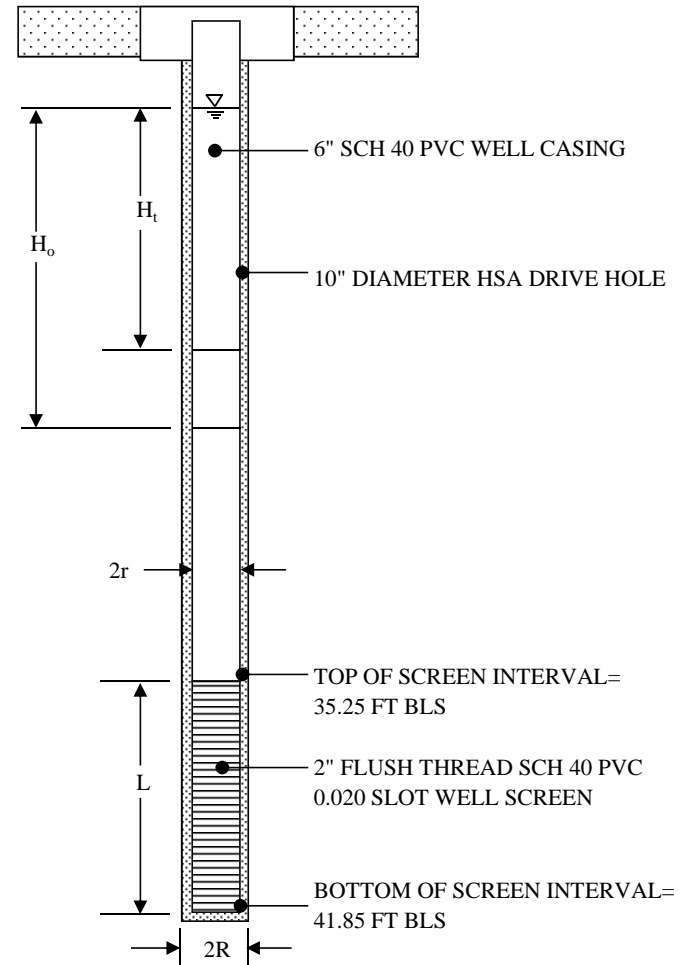
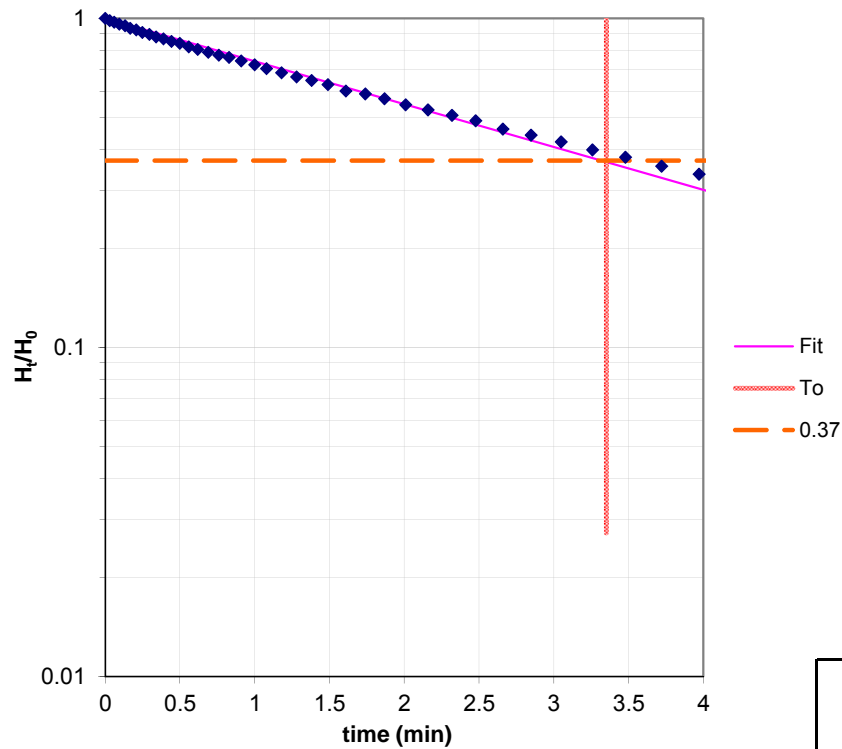
L (ft) = 6.6 Length of the screened interval

L/R = 11.314

T_0 (min) = 3.35

m = -0.3 Slope of Fit Line

K (ft/day) = 4.9 Hydraulic Conductivity



DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 1.0057 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

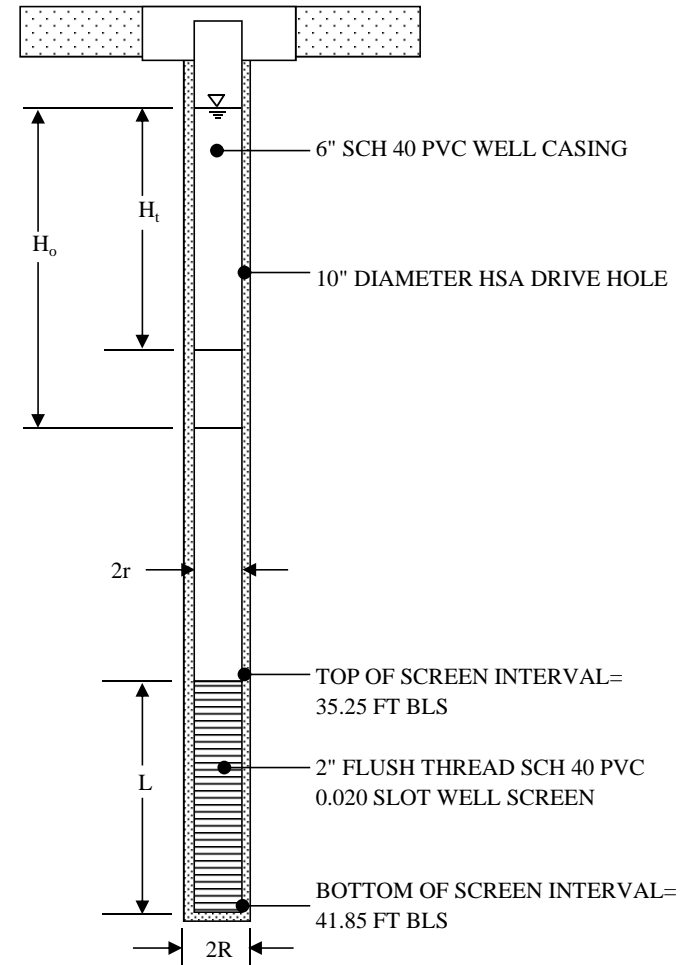
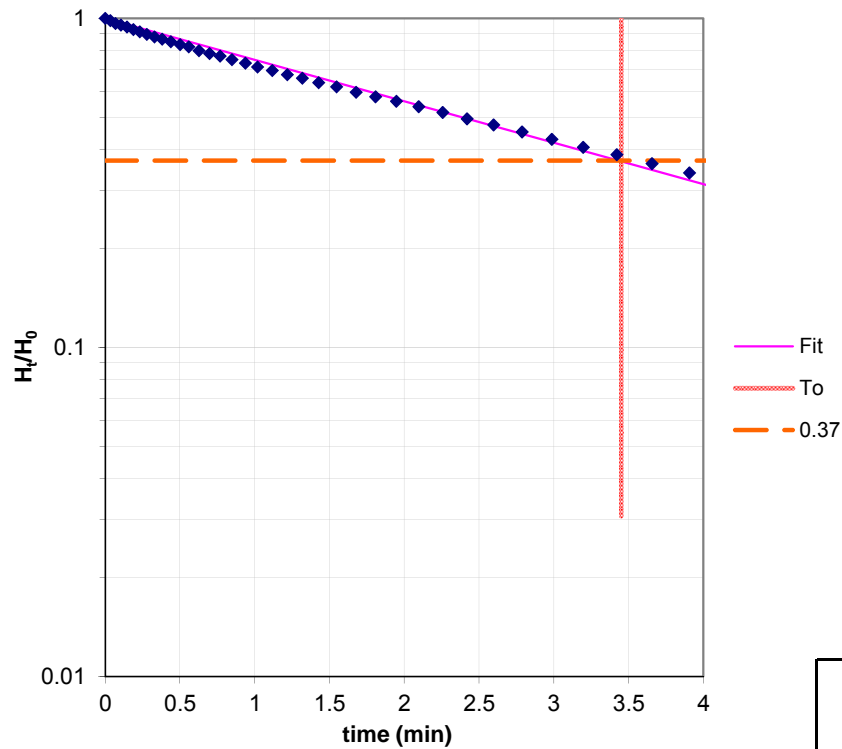
L (ft) = 6.6 Length of the screened interval

L/R = 11.314

T_0 (min) = 3.45

m = -0.29 Slope of Fit Line

K (ft/day) = 4.8 Hydraulic Conductivity



RW0007
(Test 2)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.9273 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

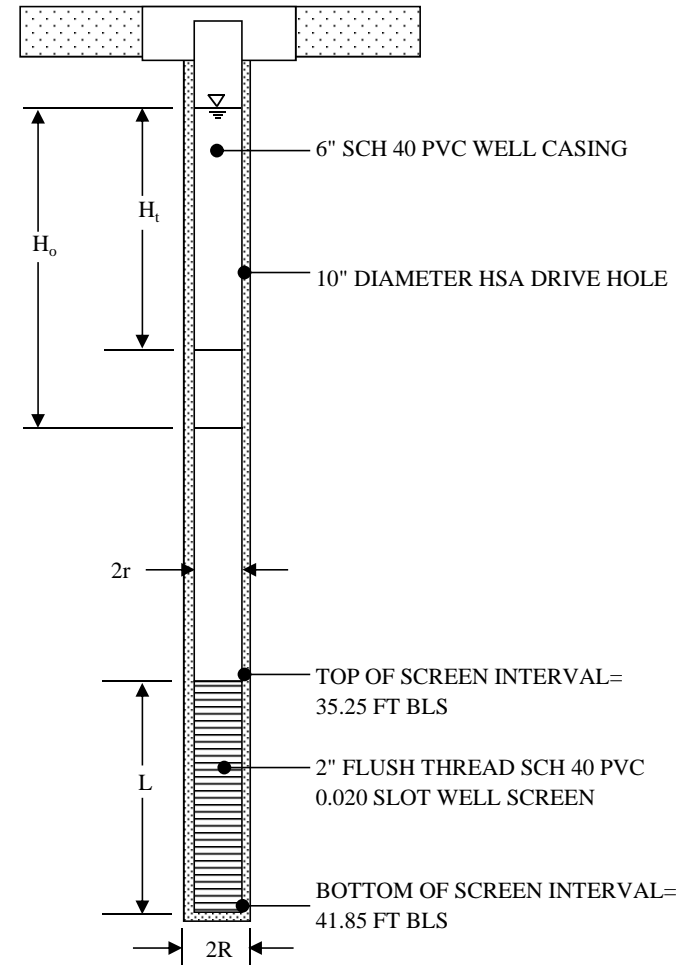
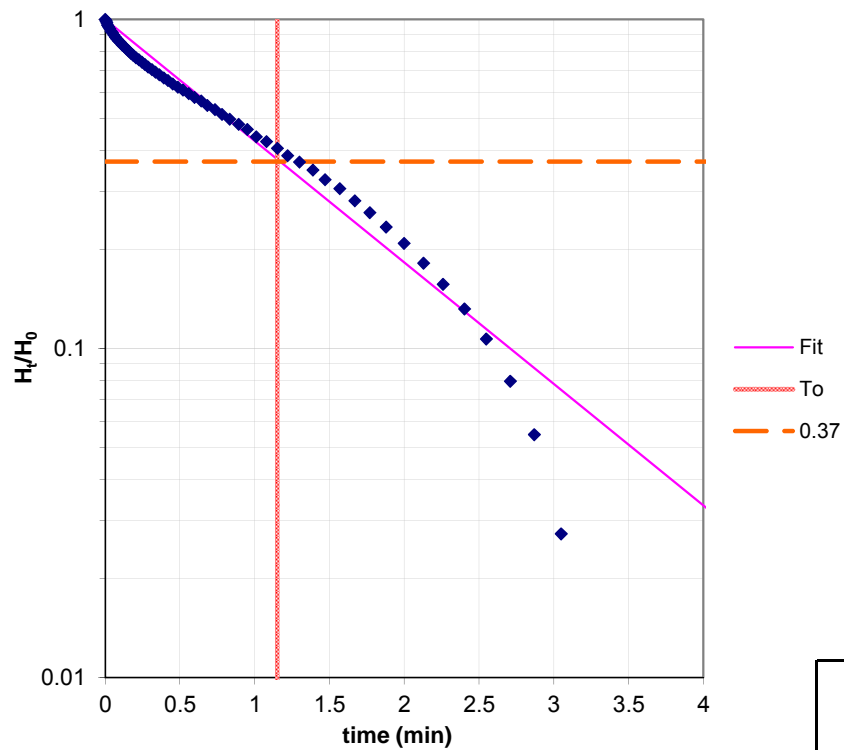
L (ft) = 6.6 Length of the screened interval

L/R = 11.314

T_0 (min) = 1.15

m = -0.85 Slope of Fit Line

K (ft/day) = 14.4 Hydraulic Conductivity



RW0007
(Test 3)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.1522 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

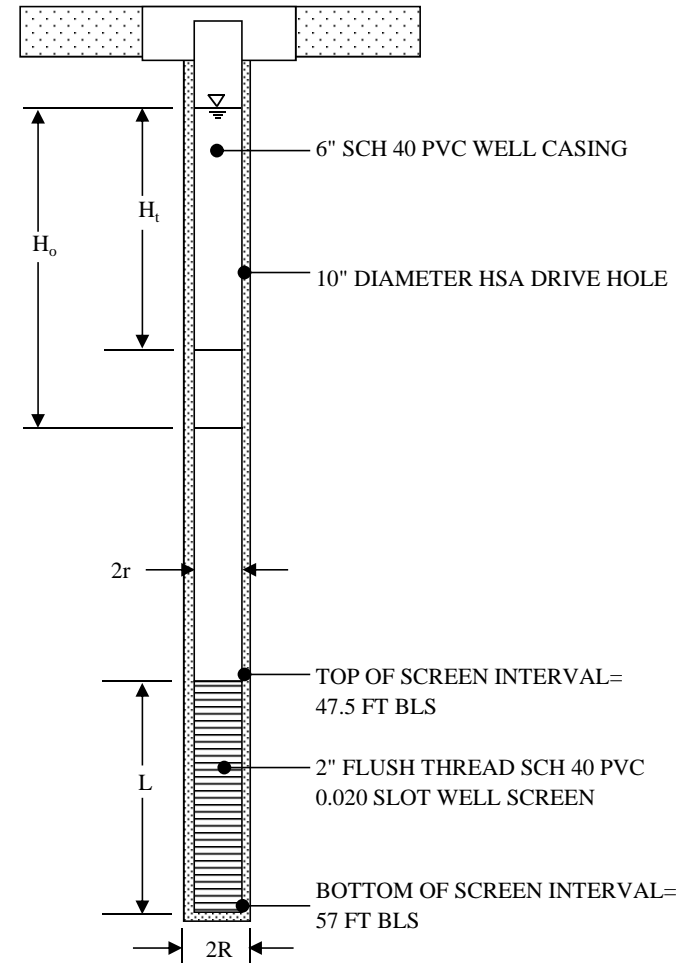
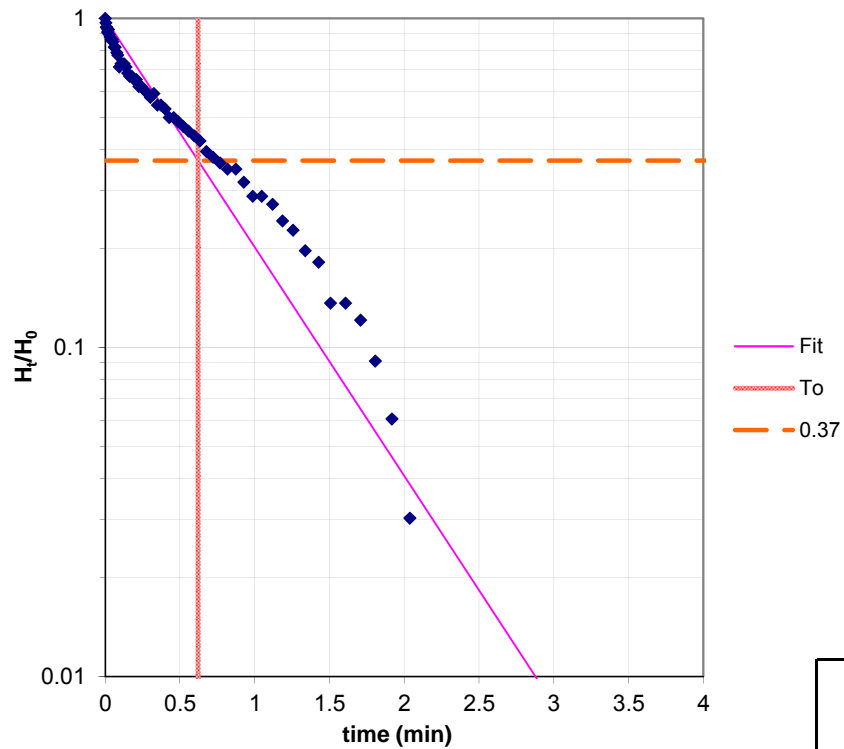
L (ft) = 9.5 Length of the screened interval

$L/R = 16.286$

T_0 (min) = 0.62

$m = -1.6$ Slope of Fit Line

K (ft/day) = 21.3 Hydraulic Conductivity



DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.6666 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

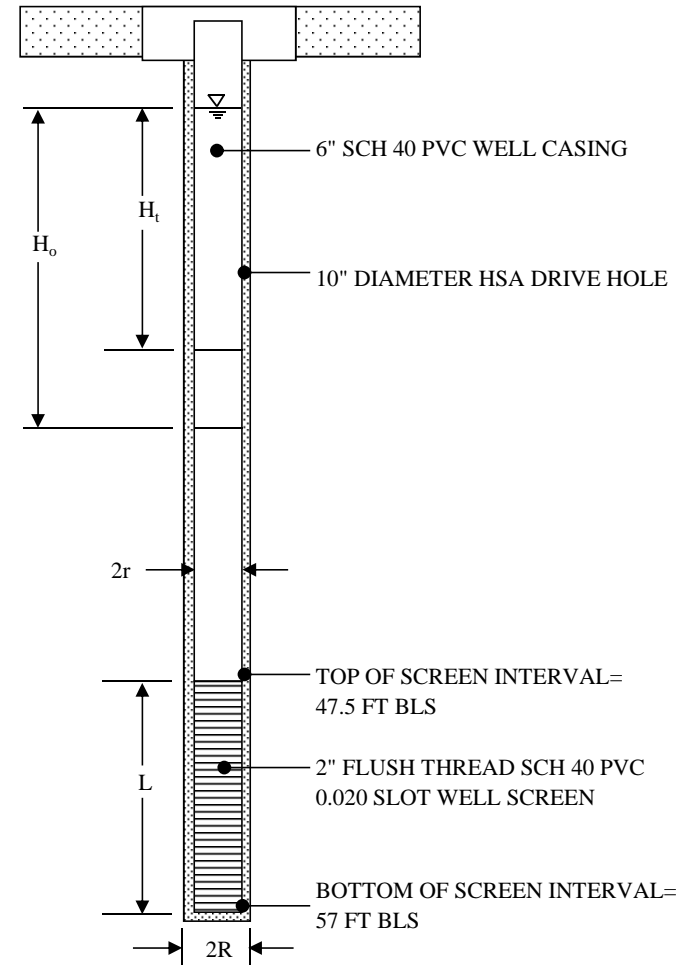
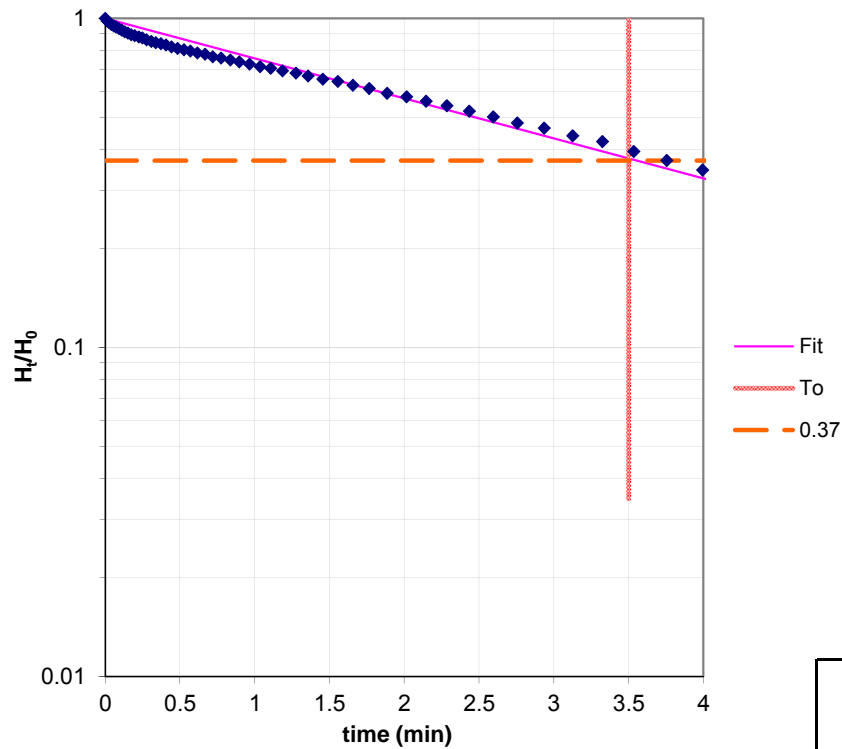
L (ft) = 9.5 Length of the screened interval

L/R = 16.286

T_0 (min) = 3.5

m = -0.28 Slope of Fit Line

K (ft/day) = 3.8 Hydraulic Conductivity



RW0008
(Test 2)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.1615 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

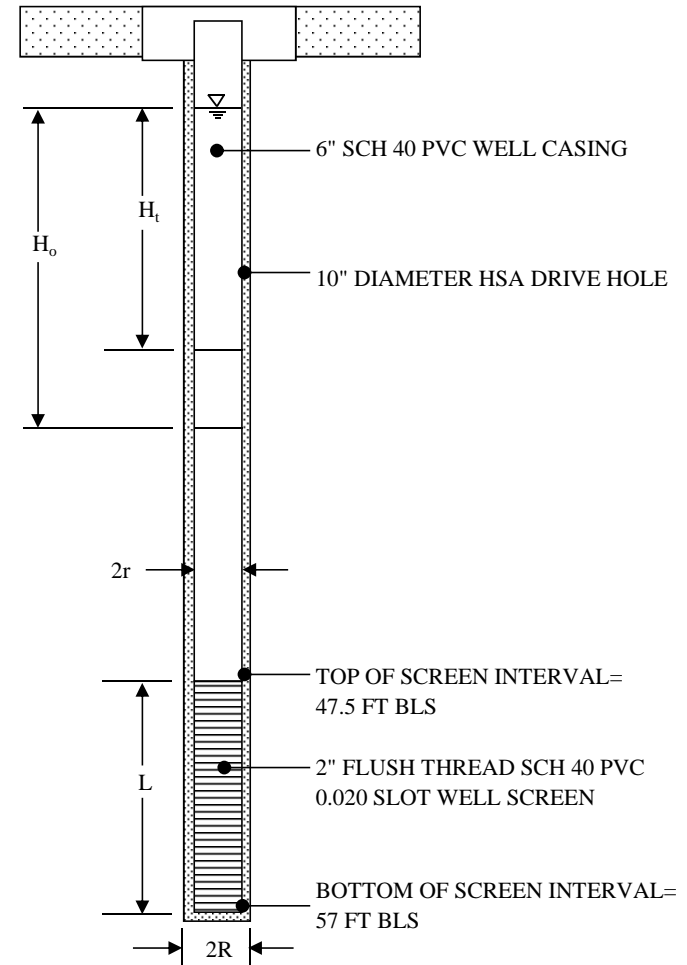
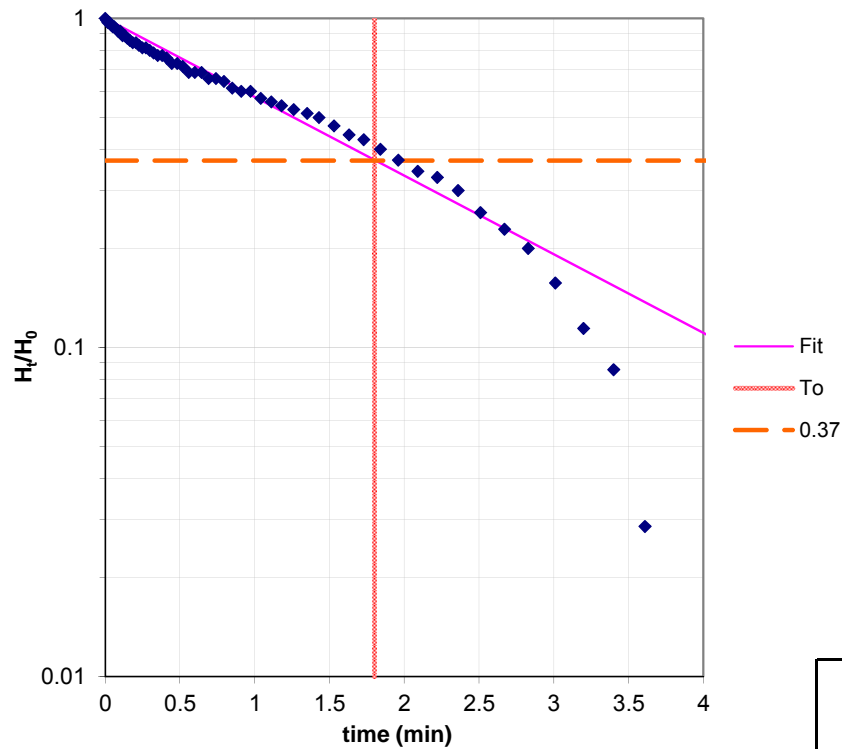
L (ft) = 9.5 Length of the screened interval

L/R = 16.286

T_0 (min) = 1.8

m = -0.55 Slope of Fit Line

K (ft/day) = 7.3 Hydraulic Conductivity



RW0008
(Test 3)

DATE 2/15/2011
PROJECT NO. ER-0716

EVALUATION OF HYDRAULIC CONDUCTIVITY (K) BY HVORSLEV METHOD

Hvorslev Equation:

$$K = \frac{r^2 \ln(L/R)}{2 L T_0}$$

H_0 (ft) = 0.2284 Maximum distance below static water level

H_t (ft) = varies Distance below static water table at time = t

r (ft) = 0.250 Radius of the well casing

R (ft) = 0.583 Radius of the borehole

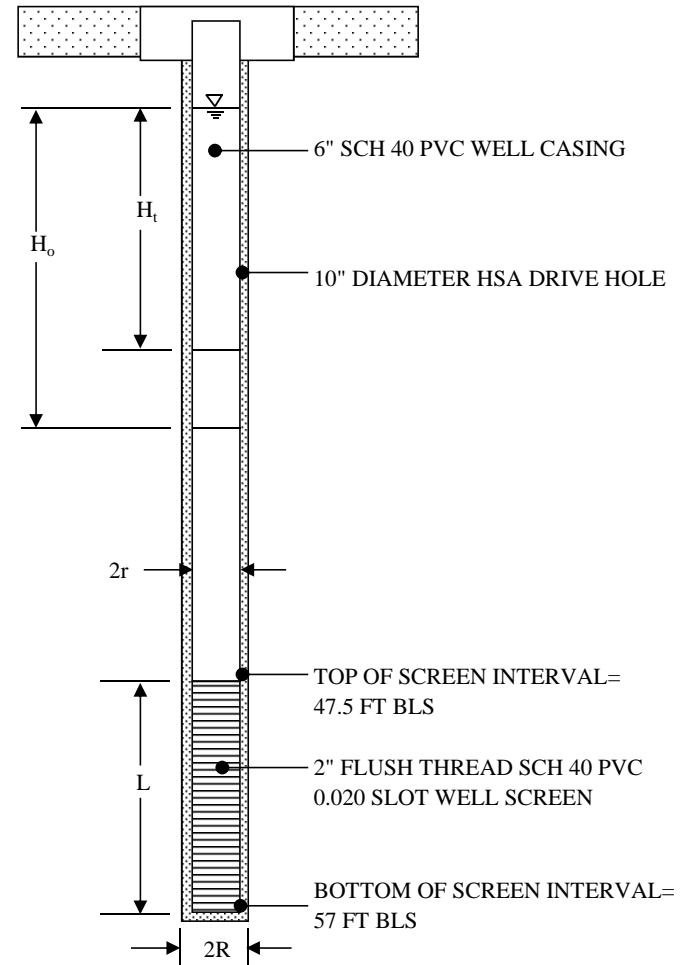
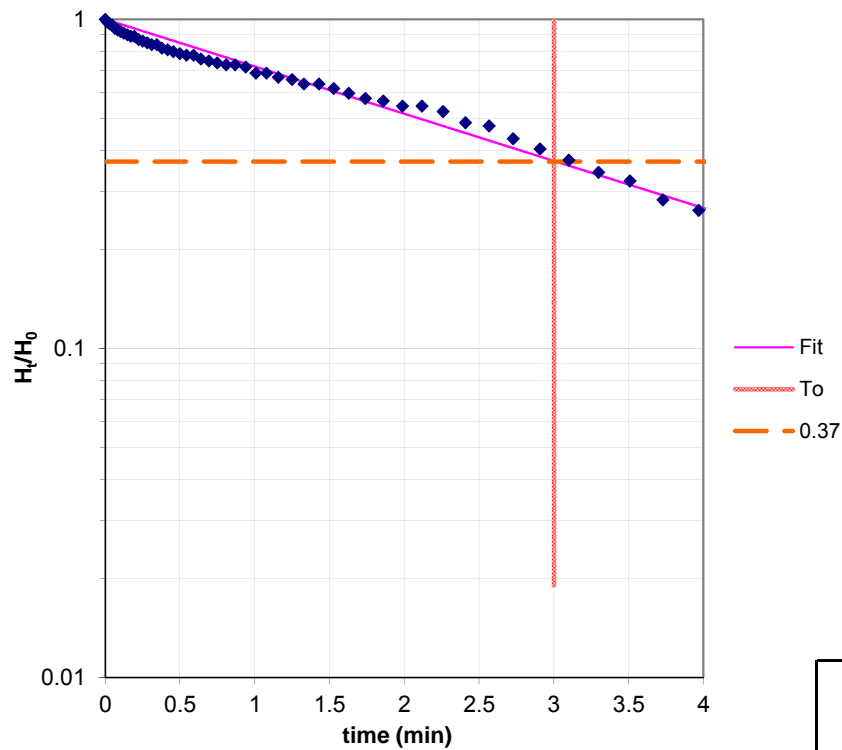
L (ft) = 9.5 Length of the screened interval

L/R = 16.286

T_0 (min) = 3

m = -0.33 Slope of Fit Line

K (ft/day) = 4.4 Hydraulic Conductivity



DATE 2/15/2011
PROJECT NO. ER-0716

ATTACHMENT B-3
IDW WASTE MANIFEST

57120

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number
FL2800016121

2. Page 1 of
1

3. Emergency Response Phone
800-771-1050

4. Waste Tracking Number

5. Generator's Name and Mailing Address
National Aeronautics and Space Administration
Mail Code TA-A4B: Building M-6, Room 1641
Kennedy Space Center, FL 32899

Generator's Site Address (if different than mailing address)
Launch Complex 34
CCAFS, FL 32920

Generator's Phone: 321-867-6971

6. Transporter 1 Company Name
FECC

U.S. EPA ID Number
FLD981748015

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Omni Waste Of Osceola County
1501 Omni Way
St. Cloud, FL 34773

U.S. EPA ID Number
NA

Facility's Phone: 407-891-3720

9. Waste Shipping Name and Description

10. Containers

No. Type
001 CM

11. Total Quantity

12. Unit Wt./Vol.
T

1. Non Regulated Material (Industrial Soil) RCRA & D.O.T. Non Hazardous, None, PF# FECC1127-11-002

2.

3.

4.

14003

13. Special Handling Instructions and Additional Information

Emergency Response/Mail Manifest To: FECC, Inc.
800/771-1050 3652 Old Winter Garden Road
PR# 469 Orlando, FL, 32805

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeor's Printed/Typed Name

Michael J. Deliz

Signature

Michael J. Deliz

Month Day Year
02 08 11

INT'L

15. International Shipments

Import to U.S.

Export from U.S.

Port of entry/exit:

Date leaving U.S.:

Transporter Signature (for exports only):

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Ernest A. Whidden

Signature

Ernest A. Whidden

Month Day Year
02 09 11

Transporter 2 Printed/Typed Name

Signature

Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space

Quantity

Type

Residue

Partial Rejection

Full Rejection

Manifest Reference Number:

U.S. EPA ID Number

17b. Alternate Facility (or Generator)

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

[Signature]

Month Day Year
2 9 11

APPENDIX C

OPERATION SUMMARY

APPENDIX C

OPERATIONS SUMMARY

Table C-1 presents a summary of the operation and monitoring of the demonstration system from the beginning of well installation in January 2011 through the end of the completion of monitoring for the Interim Measure Recirculation in September 2012. The activities conducted during the various phases of the demonstration are described in the following subsections.

Appendix B summarized the system installation and baseline characterization activities.

C.1 TASK 3 – BASELINE FLUX ASSESSMENT

Baseline Flux Assessment was conducted from 14 March 2011 through 18 April 2011 to characterize baseline groundwater conditions. As described in Appendix B, this involved continuous groundwater extraction for a period of about 4 weeks, with routine weekly sampling of the extraction wells (RW0007 and RW0008) and select monitoring wells to establish the baseline VOC profile and flux under pumping conditions in both the upper and lower sweep zones of the DEM/VAL plot.

C.1.1 BASELINE FLUX ASSESSMENT – SYSTEM OPERATION

Details of the recirculation system operation, including the volume of groundwater recirculated and the effective average flow rate, are tabulated in Table C-2 for the upper zone (RW0007) and Table C-3 for the lower zone (RW0008). Note that the hour meters, which recorded when power to the pumps was on, were not added to the system until after the Baseline Flux Assessment Phase.

In the upper zone, the cumulative volume of groundwater recirculated was 58.6 kilogallons (kgal). The effective average flow rate (calculated from the volume and total elapsed time) for the system was 1.16 gpm. The system was active for about 75% of the time (active time includes the on/off cycle [40 min on/ 20 min off; refer to Appendix B]). The upper zone system (RW0007) generally operated longer, and in the fourth week of the Baseline Flux Assessment in particular; overall time of operation was about 39% greater than the lower zone (RW0008). The cumulative volume extracted from RW0007 over time is presented in Figure C-1 A. The volume of groundwater recirculated was estimated to represent roughly 0.5 sweep zone pore volumes or 2.3 pore volume exchanges of the PED injection zone (refer to Section C.4.1.1 below, and Attachment C-5 to this Appendix).

In the lower zone (RW0008), the cumulative volume of groundwater recirculated was 44.0 kgal. The effective average flow rate for the system was 0.87 gpm; the system was active for about 54% of the time. Time of operation and hence system flow rate slowed over the four week

period, as can be seen in the figure of cumulative volume extracted over time, presented in Figure C-2 A. This was attributed to the batteries poorly holding their charge. The volume of groundwater recirculated was estimated to represent roughly 0.3 pore volumes of the lower sweep zone or 1.7 pore volume exchanges of the PED injection zone (refer to Section C.4.1.1 below, and Attachment C-5 to this Appendix).

During the Baseline Flux Assessment phase, extracted groundwater was treated with granular activated carbon (GAC) to remove VOCs before re-injection. Routine monitoring of the GAC effluent confirmed treatment (see Appendix B); VOCs were not re-injected on the perimeter of the DEM/VAL plots during this phase. Upon completion, the GAC vessels were removed from the system and placed on NASA provided spill pallets, secured with a cargo strap and disposed of by NASA with related IDW.

At the end of the Baseline Flux Assessment Phase the groundwater recirculation system was idled, ready to be re-started following PED injection.

C.1.2 BASELINE FLUX ASSESSMENT – SYSTEM O&M

Weekly O&M activities for the four week duration of the Baseline Flux Assessment Phase included the following:

- inspection of wiring and piping;
- cleaning sediment filters, solar panels, and flow meters as needed;
- recording flow rates and volumes produced from extraction wells;
- rebalancing flow rates between injection wells;
- recording flow rates (initial and adjusted) to injection wells;
- recording battery voltage and charge status (percent charged); and
- correcting any operational abnormalities as needed.

C.1.3 BASELINE FLUX ASSESSMENT – GROUNDWATER SAMPLING

Samling during the Baseline Flux Assessment Phase was described in Appendix B. The sampling program is provided in Appendix D and the samples collected are summarized in Table 2 of the main document.

C.2 TASK 4 – INTRODUCTION OF PED AND TRACERS

C.2.1 PED INJECTION

PED injection was performed from 20 to 28 June 2011 using DPT injection tools. Vironex, a licensed contractor with experience in DPT injection of bioremediation amendments, was subcontracted to perform the injections. Fluid containing PED and conservative tracers (bromide and iodide) was amended throughout the DEM/VAL plot via a set of 20 DPT injection locations. This approach was selected to achieve better initial distribution of the PED throughout the target area, rather than amending recirculated groundwater. The amendment zone targeted the center of the Hot Spot 1 area, where TCE concentrations were greatest, roughly corresponding with the area enclosed by the 30,000 µg/L TCE isopleth and extending beyond that by approximately 5 ft in all directions (refer to Figures 16 and 18 in the main document).

The target area for PED injection was estimated to be approximately 750 ft². The area within the 300 µg/L TCE isopleth, which encompasses an area of about 4,000 ft², was chosen to define the sweep zone, with the injection well pairs placed at the periphery (Figures 12 and 16).

A total of 34,000 gallons (1,700 gallons per injection point) of fluid, representing approximately 50% of the total pore volume of the target zone, was injected into the target depth interval from about 23 to 63 ft BLS. The target depth interval encompassed the silty clay horizon within which TCE concentrations were elevated. The amendment zone included about 19 ft above the clay horizon, 6 ft within the clay, and about 15 ft beneath the clay horizon. At each location, the injections were conducted in a series of steps, starting at the top of the target interval and working downwards. Injections mostly used a 2-ft injection tool to allow control of the delivery of amendment to targeted intervals; at a few locations a 5-ft injection tool was used. To the extent practicable, injections began at the periphery of the treatment area and proceeded inwards; the injection locations were completed in numerical order (refer to Figure 18), at first two and then three locations at a time (refer to the Vironex Injection Services Report in Attachment C-1 of this Appendix). Based on the target depth intervals, 50% of the total volume, or 17,000 gal of injectate, was amended to the upper sweep zone; 15% of the volume (5,100 gal) was amended within the silty clay horizon; and 35% of the volume (11,900 gal) was amended to the lower sweep zone.

The PED injection fluid was prepared in small batches in two 250-gal plastic tanks, alternating between them so that one batch could be injected while another batch was blended. Each batch contained a concentration of approximately 3,000 mg/L of nBA (roughly half of its solubility). Amendment batches were mixed for 15 minutes prior to injection to ensure complete dissolution of the nBA and tracer salts. A total of 115 gal of nBA, with a total mass of 380 kg, was added to the DEM/VAL area.

Injection rates typically ranged from 6 to 8 gpm, requiring pressures of 30 to 45 pounds per square inch (psi). At the bottom of each injection location, 10 to 35 gal of water was used to flush the lines. When injection at a location was complete, the injection tool was removed, standard DPT rods were pushed to depth and the borehole was tremie grouted to surface with Portland cement. During all injection activities, a photoionization detector (PID) was used to screen the air in the work area to ensure that a safe working environment was maintained. A summary of the injections, including individual records for each injection location, is included in the Injection Services Report (Attachment C-1). Field forms from the injection activities are provided in Attachment C-2.

C.2.2 TRACER INJECTION

Potassium bromide (KBr) was added to all injectate batches at a target bromide concentration of approximately 60 mg/L in the injection fluid. A total of roughly 11.6 kg of KBr (containing 7.8 kg of Br) was thus introduced to the treatment area. Relative bromide concentrations can be used to normalize PED concentrations to account for dilution. Based on the distribution of injectate volume between zones, 3.9 kg of bromide was added to the upper sweep zone, 1.2 kg within the silty clay horizon and 2.7 kg to the lower sweep zone.

PED injection fluids for the upper zone were also amended with potassium iodide (KI) at a target iodide concentration of 140 mg/L in the injection fluid. A total of about 11.7 kg of KI (containing 8.9 kg of I) was added to the 17,000 gal introduced into the upper zone. This concentration was selected to be somewhat higher than for bromide, since it was expected that only relatively small amounts of fluid, if any, would be transported through the clay layer from the upper sweep zone to the lower sweep zone.

C.2.3 PED AMENDMENT BATCH QUALITY CONTROL

A total of 155 batches of nBA injection fluid, each about 220 gal in volume, were prepared over the course of the injection program. To verify the actual concentrations of nBA and tracer obtained, quality control (QC) samples were collected from a random selection of the batches and submitted for laboratory analysis for nBA and tracer anions (bromide and iodide). Batch QC samples were obtained from a sample port in the injection manifold. Each day, 2 or 3 batches were sampled, resulting in a total of 17 batch samples representing roughly 10% of the total (refer to Table 2 of main document).

Results from the batch QC sampling are compiled and presented in Table E-1-3 in Appendix E. The laboratory reports are provided in Appendix G.

C.2.4 PED INJECTION CONFIRMATION SAMPLING

Two types of confirmation samples were collected to evaluate the effectiveness of the PED injections. Immediately following PED injection, DPT groundwater samples were collected at several depths adjacent to select PED injection locations to assess the radius of influence (ROI) achieved. A week later, groundwater samples were collected from select monitoring well locations within the DEM/VAL plots.

C.2.4.1 PED Injection DPT Groundwater Sampling

On 30 June 2011, two days after completion of the PED injection activities, DPT groundwater samples were collected at the four locations (DPT0328, DPT0329, DPT0330, and DPT0331) presented on Figure C-7 and analyzed in a mobile laboratory for nBA and VOCs. Split samples were submitted to a fixed laboratory for analysis of bromide and iodide. A subset of the split samples were also analyzed in the fixed laboratory for VOCs including nBA and nBuOH. A total of 18 samples were collected, from 4 or 5 depths per location.

The locations were sampled in order, starting at DPT0328. The positions were adjusted in the field in response to the results obtained by the mobile lab. Locations DPT0330 and DPT0328 were located about 2 feet and 4 feet from the nearest injection location (IP09), respectively. These locations evaluated nBA distribution at a single injection location on the periphery.

The other two sample locations evaluated nBA distribution closer to the interior of the injection grid, where more than one injection occurred. Location DPT0329 was located about 2.5 feet from the nearest injection location (IP16), and location DPT0331 was located about 6.0 feet from IP16, but within about 3.5 feet of IP06.

Sample locations were tremie grouted to surface following sample collection.

The results (VOCs, nBA, nBuOH and tracers) from the confirmation DPT groundwater sampling are compiled and presented in Table E-1-4 in Attachment E-1 in Appendix E and an analysis of this data is presented in Table E-4-1 in Attachment E-4 in Appendix E. The laboratory reports (from both the mobile and fixed laboratories) are provided in Appendix G.

C.2.4.2 PED Injection Monitoring Well Groundwater Sampling

To further assess the distribution of PED following injection, on 07 July 2011, nine days following the end of the injection event, samples were collected from eleven monitoring wells (BW0001C/D/E, BW0002C/D/E, BW0003C/D/E, RW0007, and RW0008) and laboratory analyzed for VOCs, nBA and nBuOH, and tracers (refer to Table 2 and Appendix D). During well purging, field parameters, including pH, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP), conductivity, total dissolved solids (TDS), and turbidity, were recorded at regular intervals until consecutive readings had stabilized.

The results from this confirmation sampling event are presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (Tracers) and E-1-9 (Field Geochemical Parameters) in Attachment E-1 in Appendix E; this data is also presented in Table E-4-2 in Attachment E-4 in Appendix E. The results are plotted in Figures 1, 3, 4, and 20 of the main document for the extraction wells (and the corresponding figures in Appendix E for other wells). The laboratory reports are provided in Appendix G.

C.3 TASK 5 – BIOMASS GROWTH PHASE

Following PED injection, the recirculation system remained off for a period of six weeks to allow the PED to partition into NAPL within the DEM/VAL plot and to facilitate the acclimation and establishment of biomass within the DEM/VAL plot. Groundwater extraction during this ‘shut-in’ phase was undesirable, since it might have removed much of the amended nBA and re-injected it on the periphery. At the end of the Biomass Growth Phase, the distribution of PED and VOCs within the DEM/VAL plot was assessed through DPT soil sampling and a synoptic survey of groundwater concentrations. This was intended to help to assess the partitioning effect of PED into residual DNAPL and establish a baseline before recirculation was restarted.

C.3.1 BIOMASS GROWTH PHASE – GROUNDWATER SAMPLING

Twenty-four locations, including the extraction wells, bundle monitoring wells and monitoring wells, were sampled on 1 and 2 August 2011. The samples were laboratory analyzed for VOCs, nBA and nBuOH, VFAs, tracers (Br and I), TOC, Sulfide, DHGs, Anions, Alkalinity, Dissolved Metals and microbial characterization (archived). The analyses are summarized in Table 2 and detailed in Appendix D.

Results from the Biomass Growth Phase sampling event are compiled and presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-8 (Dissolved Metals) and E-1-9 (Field Geochemical Parameters) in Attachment E-1 in Appendix E. The VOC data is plotted in Figures 1, 3, 4 and 20 of the main document and in the corresponding time-trend and VOC distribution plots included in Appendix E. The TOC and VFA data is also plotted in Figure 2. The VOC data is used in the plume mass estimates in Section E.6.1 and Attachment E-6 in Appendix E and Figure 21 of the main document. Attachment E-5 in Appendix E presents the organic carbon data (VOCs, nBA, nBuOH and VFAs) on a molar basis. The laboratory reports from these sampling events are provided in Appendix G.

C.3.2 BIOMASS GROWTH PHASE – SOIL SAMPLING

On 3 August 2011, three soil cores (DPT0332, DPT0333, and DPT0334) were collected using DPT techniques at the locations presented on Figure 17 (main document). Seventeen sample intervals were selected by PID screening. Subsamples were collected and analyzed for VOCs

and nBA. In addition, the cores were visually logged to document soil lithology. Boring logs are provided with the field forms in Attachment C-2 of this Appendix. Soil IDW was contained in properly labeled 55-gallon drums which were stored on NASA provided spill pallets secured with cargo straps.

Results from the soil sampling event are presented in Table E-1-1 in Attachment E-1 in Appendix E. Laboratory results from this sampling event are provided in Appendix G.

C.4 TASK 6 –RECIRCULATION SYSTEM OPERATION

The groundwater recirculation system was activated on 09 August 2011 and operated for approximately thirteen months, until 13 September 2012. The first seven months (28 weeks), through 16 February 2012, are considered the Main Recirculation Phase, which corresponds to the duration of the DEM/VAL proposed in the TDP. System operation was continued for an additional seven months, through 13 September 2012, under an Interim Measure Work Plan (IMWP) for NASA. This continuation period is referred to as the Interim Measure Recirculation Phase.

C.4.1 RECIRCULATION SYSTEM OPERATION - SYSTEM OPERATION

C.4.1.1 Main Recirculation Phase

Details of the recirculation system operation, including the volume of groundwater extracted and re-injected, the time of operation, the effective average flow rate and the percentage of time active, are tabulated in Table C-2 for the upper zone (RW0007) and Table C-3 for the lower zone (RW0008).

Figure C-5 presents the hydrograph of the water level in the upper extraction well (RW0007) for the first month of operation. The effect of the 40 minutes on, 20 minutes off timing cycle is clearly shown in the oscillation of the water level. The response to pumping is rapid (on and off). The shape of the curve is partly due to the recording frequency of 15 minutes; data is recorded at varying points in the drawdown/recovery cycle. The figure also shows the longer shut off periods, when the system ran out of power, typically a little after midnight. Peak drawdown was about 7.5 feet, with an average drawdown of about 4 feet, estimated as the midpoint of the oscillating water level during active pumping. Hydrographs for the remainder of the recirculation system operation are presented in Attachment C-4 to this Appendix.

Figure C-6 presents the hydrograph of the water level in the lower extraction well (RW0008) for the first month of operation. Hydrographs for the remainder of the recirculation system operation are presented in Attachment C-4 to this Appendix. A similar pattern in the water level was observed in RW0008, with fine oscillations resulting from the timing cycle and larger overnight idle periods. In RW0008 the peak drawdown was approximately 27.5 feet, with

average drawdown of approximately 22 feet. At RW0008, the water level did not fully recover during the 20 minute downtime in the pump cycle; recovery was about 15 feet. Hence, during the period of active cycling, an effective hydraulic gradient was maintained towards the well. Greater drawdown reflects a lower transmissivity at RW0008, since the pumps operated similarly at about 2.5 gpm when powered. The difference in drawdown between the extraction wells meant that there was generally a hydraulic gradient downward across the silty clay confining layer in the vicinity of the extraction wells.

Attachment C-4 includes hydrographs for wells IW0002D, IW0002D1, IJ0013 and IJ0014 during the Main Recirculation Phase (after which the leveloggers were removed and were not deployed during the Interim Measure Recirculation Phase). The influence of the extraction wells is shown in the hydrographs for wells IW0002D and IW0002D1, which are located 6.7 feet and 11.9 feet from RW0007 and RW0008, respectively. For example, during Week 3 (last week of August 2011), drawdown at IW0002D was about 0.46 ft and at IW0002D1 was about 0.60 ft. Response to pumping was immediate, and the fine oscillations of the timing cycle were observed in both the upper and lower zones.

In both the upper and lower zones, the flow of extracted water was split evenly between five peripheral injection wells (Figure 13 in the main document). The flow splits were checked and rebalanced during the routine O&M visits (see Section C.4.2 below). Flow to each injection well was approximately 0.5 gpm during actual pumping. The effective average injection rates were approximately 0.17 gpm per injection location in the upper zone (0.16 gpm in the lower). Hydrographs for a pair of injection wells, IJ0013 and IJ0014, are presented in Attachment C-4. For IJ0013 the mound during pumping was approximately 1.7 ft (perhaps half this, 0.85 ft on average during active cycle). For IJ0014, the injection mound during pumping was approximately 2.4 ft. Comparison of the hydrographs suggests that an upward hydraulic gradient may exist both during active pumping and during non-pumping periods. The water level in the lower unit (IJ0014) was above that in the upper unit (IJ0013) during injection (greater mounding) and remained higher during periods with no injection. Note that actual groundwater elevations could not be determined (since TOC elevations were not surveyed).

Figure C-3 summarizes the operating history for RW0007, showing the percentage of time that the system was active and the cumulative volume extracted. The categories (x-axis) represent O&M events and are not evenly spaced in time. The cumulative volume extracted as a function of time is presented in Figure C-1 B, which shows a fairly uniform rate over the duration of the field demonstration. Details of the recirculation system operation are tabulated in Table C-2.

A total of 243.4 kgal were recirculated in the upper zone. The effective average flow rate for the system was 0.89 gpm. The system was active for about 53% of the time (active time includes the on/off cycle). Variations in the amount of time the system was active are apparent in Figure C-3; weather, and hence recharge of the solar-powered recirculation system was the main variable controlling system operation.

The upper zone (RW0007) typically operated for somewhat longer than the lower zone (RW0008), averaging 9% more time active. This is attributed to differences in the power required for the pumps to recirculate water in the upper versus lower zone wells; in the lower zone, the system created greater drawdown and consequently needed to lift the water further during pumping, and the greater injection mounding created slightly more resistance due to backpressure. There may have also been minor differences in the efficiency of the solar panels that recharged the system batteries.

Figure C-4 summarizes the operating history for RW0008, showing the percentage of time that the system was active and the cumulative volume extracted. The cumulative volume extracted as a function of time is presented in Figure C-2 B, which shows a fairly uniform rate over the duration of the demonstration. Details of operation are tabulated in Table C-3.

A total of 221.6 kgal were recirculated in the lower zone. The effective average flow rate for the system was 0.81 gpm. The system was active for about 48% of the time (active time includes the on/off cycle). Variations in the amount of time the system was active are apparent in Figure C-4. As with the upper zone system, weather, and hence recharge of the solar-powered system, was the main variable controlling system operation.

PED injection delivered a total of 34,000 gal of amendment fluid. Of this, 17,000 gal was injected into the upper zone, 5,100 gal into the silty clay horizon, and 11,900 gal into the lower zone. Thus the upper zone recirculation volume was a factor of 14.3 greater than the injectate volume, while the lower zone recirculation volume was a factor of 18.6 greater than its corresponding injectate volume. Considering that the design volumes were selected to target 50% of the pore volume in the injection zone, the recirculated volumes in the upper and lower zones represent approximately 7 and 9 pore volume replacements, respectively.

Although it is not possible to determine the actual volume of groundwater involved in the recirculation cells in each sweep zone, some estimates can be made. For the upper zone, the thickness of the saturated aquifer above the silty clay is about 36 feet. Of this, 20 feet was targeted for injection. The extraction well RW0007 has a screened interval of 7 feet, and the injection wells have 10 ft screens, all situated at the base of the upper zone, directly above the silty clay horizon to direct flow across this layer where most of the TCE mass was thought to reside. The relatively short screens in these partially penetrating wells will induce vertical flow components, which will be most prominent near the wells. Horizontal flow is likely not established, since that would require distances beyond about 1.5 times the thickness of the aquifer (i.e., horizontal flow would be expected about 54 ft from an extraction or injection well) and the injection wells are all within this distance of the extraction wells. However, because of the relatively short well screens, the majority of flow is expected to occur in the lower portion of the zone. Thus, the depth interval through which groundwater was recirculated was most likely between 10 and 20 feet. Estimates of the pore volume for various thicknesses and radial distances were calculated (presented in Attachment C-5 to this Appendix). Using a thickness of

15 ft, and a radius of 35 ft, which roughly corresponds to the position of the injection wells, the pore volume of the upper sweep zone was estimated to be 130 kgal, and the volume recirculated in the Main Recirculation Phase corresponds to 1.9 pore volumes. The table in Attachment C-5 shows how this estimate varies with the assumed thickness of the sweep zone; if 20 ft thick, the recirculated volume was about 1.4 pore volumes. If just the area within which PED injection occurred is considered, the number of pore volume exchanges is estimated to be about 9.6.

Corresponding estimates were made for the lower sweep zone, as shown in Attachment C-5 for RW0008. The extraction well (RW0008) and injection wells have 10 ft screens, and the PED injections spanned a 15 ft thickness. Assuming a thickness of 15 ft, the pore volume of the lower sweep zone was estimated to be 130 kgal and the volume recirculated in the Main Recirculation Phase was about 1.7 sweep zone pore volumes, or about 8.8 pore volume exchanges of the PED injection area.

These estimates of pore volume demonstrate that considerably more groundwater was recirculated than was initially amended with PED and injected. The fact that extracted water continued to contain donor equivalents indicates that the initial injection was able to supply donor to several multiples of the initial injectate volume.

C.4.1.2 Interim Measure Recirculation Phase

Operation continued unchanged for the Interim Measure Recirculation Phase. Hydrographs for RW0007 and RW0008 for the full period of operation are presented in Attachment C-4. Leveloggers were not deployed in any other wells during this phase.

The operating history for the upper zone (RW0007) is presented in Figure C-3, wherein the purple bars for Time Active indicate the Interim Measure Recirculation Phase. Details of operation are tabulated in Table C-2. The system was active for about 49% of the time, slightly less than during the Main Recirculation Phase. The effective average flow rate for the system was 0.82 gpm, down slightly from the prior phase. The recirculated volume for the upper sweep zone was 240.9 kgal, representing an additional 1.9 pore volumes, or approximately 9.5 additional exchanges of the PED injected area (refer to Attachment C-5 for tabulated estimate).

The operating history for the lower zone (RW0008) is presented in Figure C-4, wherein the purple bars for Time Active indicate the Interim Measure Recirculation Phase. Details of operation are tabulated in Table C-3. The system was active for about 47% of the time, essentially the same as during the Main Recirculation Phase. The effective average flow rate for the system was 0.81 gpm, the same as during the prior phase. The recirculated volume for the lower sweep zone was 239.2 kgal, representing an additional 1.8 pore volumes, or approximately 9.5 additional exchanges of the PED injected area (refer to Attachment C-5 for tabulated estimate).

C.4.2 RECIRCULATION SYSTEM OPERATION - SYSTEM O&M

The groundwater recirculation system operated continuously, with routine O&M inspections to ensure consistent operation of the system (weekly inspections for the first five months, once every 1.5 weeks until the end of the Main Recirculation Phase in Month 7, then biweekly for the Interim Measure Recirculation Phase through until Month 13).

Routine O&M events included the following:

- recording of operational parameters including total volume extracted, extraction flow rates, total operable time (hour meter), battery voltage and charge status, and individual flow rates to the injection wells;
- adjustment of flow rates to injection wells as required to maintain balance of flow between injection wells;
- cleaning and replacing filters as required;
- inspection of visible equipment and tubing runs for leaks or damage and performance of needed maintenance;
- inspection of the solar panels, charge controller and batteries and performance of needed maintenance; and
- periodic retrieval of water level data from the data loggers.

On a few occasions it was necessary to remove a pump for repair. No rehabilitation or re-development of the wells was required. O&M forms are included in Attachment C-3 of this Appendix.

C.4.3 RECIRCULATION SYSTEM OPERATION - GROUNDWATER SAMPLING

C.4.3.1 Groundwater Sampling - Main Recirculation Phase

Throughout the Main Recirculation Phase, groundwater samples were routinely collected to assess the VOC mass flux and evaluate the microbial reductive dechlorination of VOCs.

The extraction wells were sampled weekly for the first month and then bi-weekly for five months thereafter. Samples were analyzed for the parameters in Table 2 of the main document, as detailed in the sampling program in Appendix D. Samples were collected for the assessment of various constituents, namely VOCs, nBA and its hydrolysis product, nBuOH, related fermentation products (i.e., butyrate, acetate, etc. [VFAs]), and the bromide and iodide tracers. To support the interpretation of the data, samples for additional parameters, such as TOC, anions, dissolved metals, DHGs and alkalinity were also collected, along with field parameters (DO, ORP, specific conductivity). Samples for microbial characterization were collected on a monthly basis and archived, with analysis of only the Month 3 and Month 7 samples.

A synoptic survey of the DEM/VAL plot monitoring locations, including extraction wells, bundle monitoring wells, existing site monitoring wells and the far-field monitoring wells (30 wells in total) was conducted at Month 3 (October 2011) and at Month 7 (February 2012), at completion of the Main Recirculation Phase. The samples were laboratory analyzed for VOCs, nBA and nBuOH, VFAs, tracers (Br and I), TOC, DHGs, Sulfide, Anions, Alkalinity, Dissolved Metals and microbial characterization (at select locations). The details of the sampling program are presented in Appendix D and the samples are summarized in Table 2 of the main document.

Results from the Main Recirculation Phase sampling events are compiled and presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-8 (Dissolved Metals), E-1-9 (Field Geochemical Parameters) and E-1-10 (*Dhc* and *vcrA*) in Attachment E-1 in Appendix E. The VOC data is plotted in Figures 1, 3, 4 and 20 of the main document and in the corresponding time-trend and VOC distribution plots included in Appendix E. The TOC and VFA data is also plotted in Figure 2. The VOC data is used in the plume mass estimates in Figure 21. Attachment E-5 in Appendix E presents the organic carbon data (VOCs, nBA, nBuOH and VFAs) on a molar basis. The laboratory reports from these sampling events are provided in Appendix G.

C.4.3.2 Groundwater Sampling – Interim Measure Recirculation Phase

A somewhat reduced groundwater sampling program was conducted during the Interim Measure Recirculation Phase, from Month 7 until the end in Month 13; the frequency of extraction well monitoring was reduced to monthly sampling for VOCs (including nBA and nBuOH). A synoptic survey was collected in Month 10 (June 2012) and at the end of operation in Month 13 (September 2012). Samples were were laboratory analyzed for VOCs (including nBA and nBuOH), TOC, and DHGs; select locations were sampled for microbial characterization. The far-field wells were removed from the program for Month 13, in accordance with the UIC permit, since the previous two events had shown no nBA at these locations. The sample analyses are listed in Table 2 and in the detailed program in Appendix D.

Results from the Interim Measure Recirculation Phase sampling events are compiled and presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-9 (Field Geochemical Parameters) and E-1-10 (*Dhc* and *vcrA*) in Attachment E-1 in Appendix E. The VOC data is plotted in Figures 1, 3, 4 and 20 of the main document and in the corresponding time-trend and VOC distribution plots included in Appendix E. The TOC and VFA data is also plotted in Figure 2. The VOC data is used in the plume mass estimates in Figure 21. Attachment E-5 in Appendix E presents the organic carbon data (VOCs, nBA, nBuOH and VFAs) on a molar basis. The laboratory reports from these sampling events are provided in Appendix G.

C.4.4 RECIRCULATION SYSTEM OPERATION - SOIL SAMPLING

Soils samples were collected at the end of the Main Recirculation Phase (Month 7) and at the end of the Interim Measure Recirculation Phase (Month 13). Three soil cores (DPT0346, DPT0347, and DPT0348) were collected on 13 February 2012 and three soil cores (DPT0349, DPT0350, and DPT0351) were collected on 10 September 2012. As shown in Figure 17 (main document), the locations corresponded to the locations (DPT0332, DPT0333, and DPT0334) sampled following the Biomass Growth Phase (03 August 2011), to facilitate comparison over the course of the DEM/VAL. Soil cores were collected using DPT techniques, screened with a PID, and subsampled at various depths based on the PID response and lithology. Boring logs that document the soil lithology are provided with the field forms in Attachment C-2 of this Appendix. A total of 24 samples were selected during the Month 7 sampling event and 22 were selected during the Month 13 event. The samples were submitted to a fixed laboratory for analysis for VOCs, including nBA and nBuOH (refer to Table 2). Select soil samples from the final event in Month 13 were analyzed for *Dhc* and *vcra* (data not reported herein). Soil IDW was contained in properly labeled 55-gallon drums which were stored on NASA provided spill pallets secured with cargo straps.

The results from the soil sampling events are compiled and presented in Table E-1-1 in Attachment E-1 in Appendix E. Laboratory reports from these sampling events are provided in Appendix G.

C.5 TASK 7 - SYSTEM DEMOBILIZATION

The system was turned over to NASA at the end of the Main Recirculation Phase, to conduct the Interim Measure Recirculation Phase. At the end, the system was simply idled. NASA may decide to perform further remediation at Hot Spot 1 in the future.

C.6 ATTACHMENTS

Table C-1	PED DEM/VAL Event Schedule Summary
Table C-2	History of Operation for RW0007
Table C-3	History of Operation for RW0008
Figure C-1 A	RW0007 - Volume of Water Recirculated during Baseline Flux Assessment
Figure C-1 B	RW0007 - Volume of Water Recirculated during Recirculation System Operation
Figure C-2 A	RW0008 - Volume of Water Recirculated during Baseline Flux Assessment
Figure C-2 B	RW0008 - Volume of Water Recirculated during Recirculation System Operation
Figure C-3	RW0007 Operating History
Figure C-4	RW0008 Operating History
Figure C-5	Water Level at Upper Extraction Well (RW0007) – Month 1
Figure C-6	Water Level at Lower Extraction Well (RW0008) – Month 1
Figure C-7	Injection Confirmation Monitoring Locations
Attachment C-1	Vironex Injection Report
Attachment C-2	Field Forms
Attachment C-3	O&M Forms
Attachment C-4	Hydrographs
Attachment C-5	Recirculated Pore Volume Estimates

TABLE C-1. PED DEM/VAL EVENT SCHEDULE SUMMARY

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Task	Task Name	Date	Activity
1	Well Installation	17 to 21 and 24 & 25 January 2011	Well Installations & Baseline Soil Sampling
2	Baseline Sampling	1 to 3 February 2011	Baseline groundwater sampling
2	Baseline Sampling	15-Feb-11	Baseline hydraulic conductivity assessments
1	System Install & Shake Down	March 2011	Groundwater recirculation system constructed, including mobile trailer
3	Baseline Flux Assessment	14-Mar-11	Groundwater recirculation system start up
		22-Mar-11	BFA Week 1 Groundwater Sampling
		28-Mar-11	BFA Week 2 Groundwater Sampling
		7-Apr-11	BFA Week 3 Groundwater Sampling
		18 and 19 April	BFA Week 4 Groundwater Sampling Synoptic Survey
		18-Apr-11	Recirculation system shut down
4	Introduction of PED & Tracers	20 to 24 and 27 & 28 June 2011	PED Injection Activities
		30-Jun-11	DPT groundwater sampling (DPT328 – DPT331) to aid in evaluation of radius of influence from injection activities
		7-Jul-11	Groundwater sampling from select site monitoring wells to evaluate nBA distribution
5	Biomass Growth Phase	July to August 2011	Biomass growth phase – recirculation system off
		1 to 3 August 2011	Post-biomass growth phase soil and groundwater sampling
6a	Recirculation System Operation	9-Aug-11	Restart groundwater recirculation system
		12-Aug-11	Week 1 O&M and groundwater sampling (RW wells only)
		18-Aug-11	Week 2 O&M and groundwater sampling (RW wells only)
		24-Aug-11	Week 3 O&M and groundwater sampling (RW wells only)
		31-Aug-11	Week 4 O&M and groundwater sampling (RW wells only)
		8-Sep-11	Week 5 O&M
		15-Sep-11	Week 6 O&M and groundwater sampling (RW wells only)
		22-Sep-11	Week 7 O&M
		28-Sep-11	Week 8 O&M and groundwater sampling (RW wells only)

TABLE C-1. PED DEM/VAL EVENT SCHEDULE SUMMARY

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Task	Task Name	Date	Activity
6a	Recirculation System Operation (cont'd)	5-Oct-11	Week 9 O&M
		13-Oct-11	Week 10 O&M and groundwater sampling (RW wells only)
		20-Oct-11	Week 11 O&M
		25- to 27-Oct-11	Week 12 (Month 3) O&M and groundwater sampling (synoptic survey)
		3-Nov-11	Week 13 O&M
		10-Nov-11	Week 14 O&M and groundwater sampling (RW wells only)
		17-Nov-11	Week 15 O&M
		22-Nov-11	Week 16 O&M and groundwater sampling (RW wells only)
		1-Dec-11	Week 17 O&M
		7-Dec-11	Week 18 O&M
		15-Dec-11	Week 19 O&M and groundwater sampling (RW wells only)
		22-Dec-11	Week 20 O& M
		5-Jan-12	Week 22 O&M and groundwater sampling (RW wells only)
		16-Jan-12	Week 24 O&M
		26-Jan-12	Week 25 O&M and groundwater sampling (RW wells only)
		6-Feb-12	Week 27 O&M
		13-Feb-12	Week 28 (Month 7) Final Soil Samples
		14- to 16-Feb-12	Week 28 (Month 7) O&M and Final Dem/Val Groundwater Sampling (synoptic survey)
6b	Interim Measure Recirculation Phase	2-Mar-12	Week 30 O&M
		15-Mar-12	Week 32 O&M and groundwater sampling (RW wells only)
		5-Apr-12	Week 35 O&M
		19-Apr-12	Week 37 O&M and groundwater sampling (RW wells only)
		4-May-12	Week 39 O&M
		17-May-12	Week 41 O&M and groundwater sampling (RW wells only)
		7-Jun-12	Week 44 O&M
		21-Jun-12	Week 46 O&M

TABLE C-1. PED DEM/VAL EVENT SCHEDULE SUMMARY

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Task	Task Name	Date	Activity
6b	Interim Measure Recirculation Phase (cont'd)	26- to 27-Jun-12	Week 47 (Month 10) groundwater sampling (synoptic survey)
		10-Jul-12	Week 49 O&M
		19-Jul-12	Week 50 O&M and groundwater sampling (RW wells only)
		2-Aug-12	Week 52 O&M
		16-Aug-12	Week 54 O&M and groundwater sampling (RW wells only)
		6-Sep-12	Week 57 O&M (final totalizer readings; system on)
		10-Sep-12	Week 58 soil sampling
		13-Sep-12	Week 58 (Month 13) groundwater sampling (synoptic survey)
			** no final readings from time system was turned off

FIGURE C-1
VOLUME OF GROUNDWATER RECIRCULATED IN UPPER ZONE (RW0007)

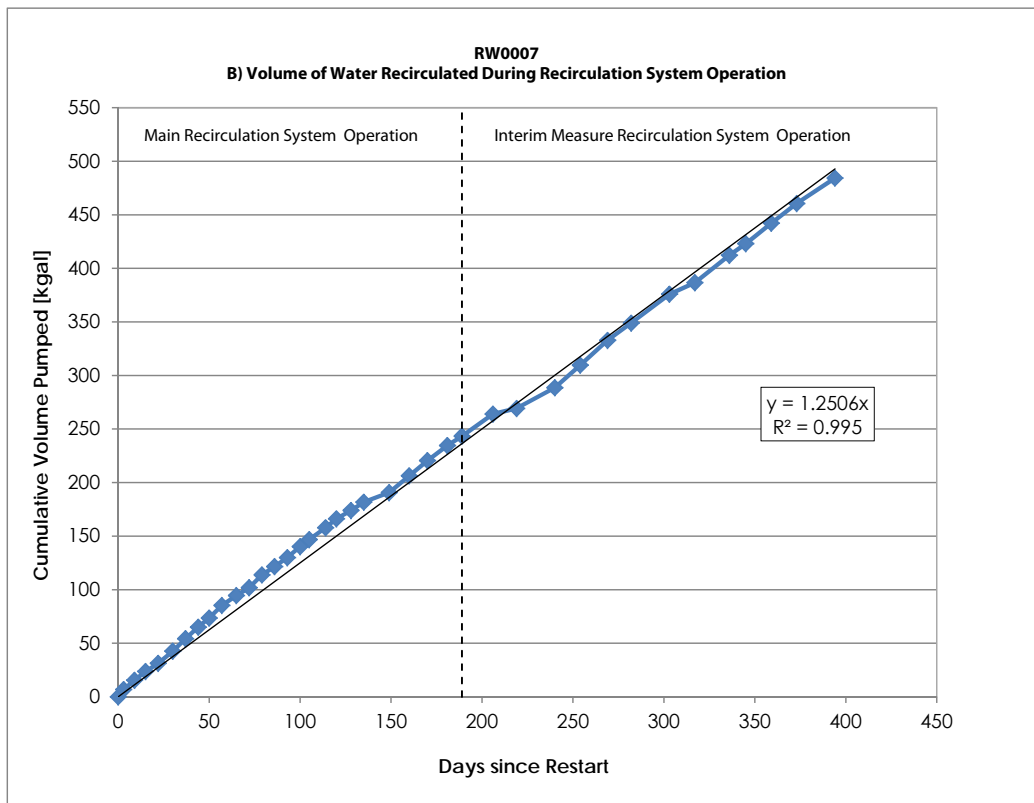
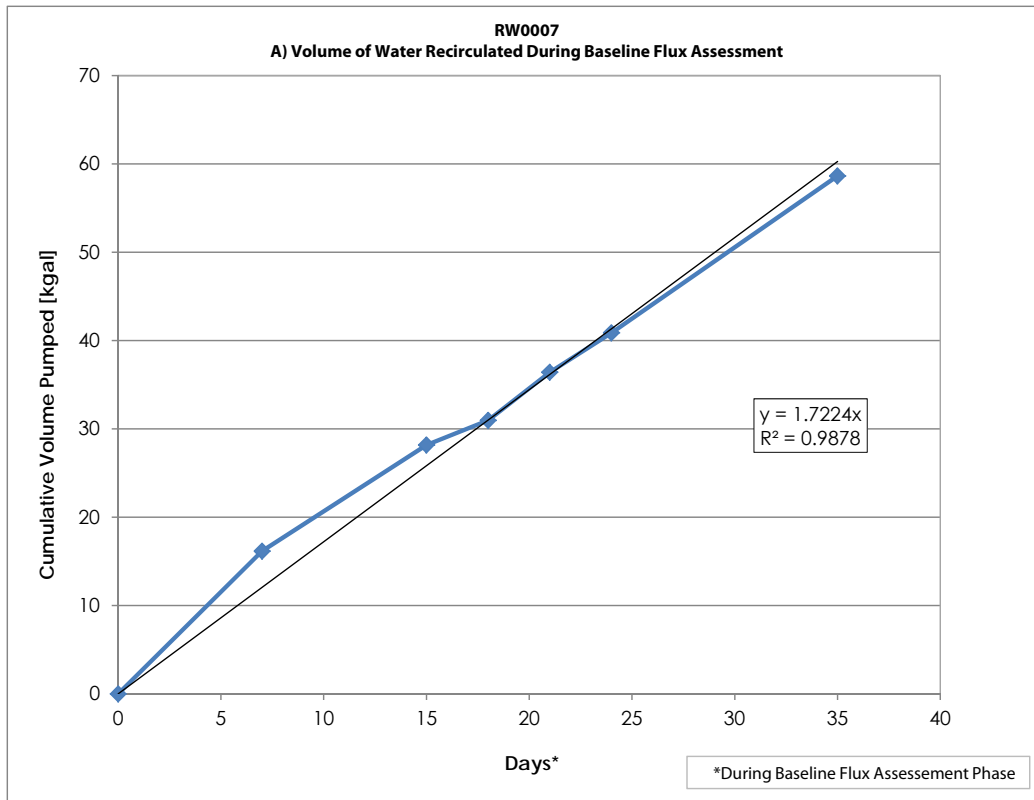
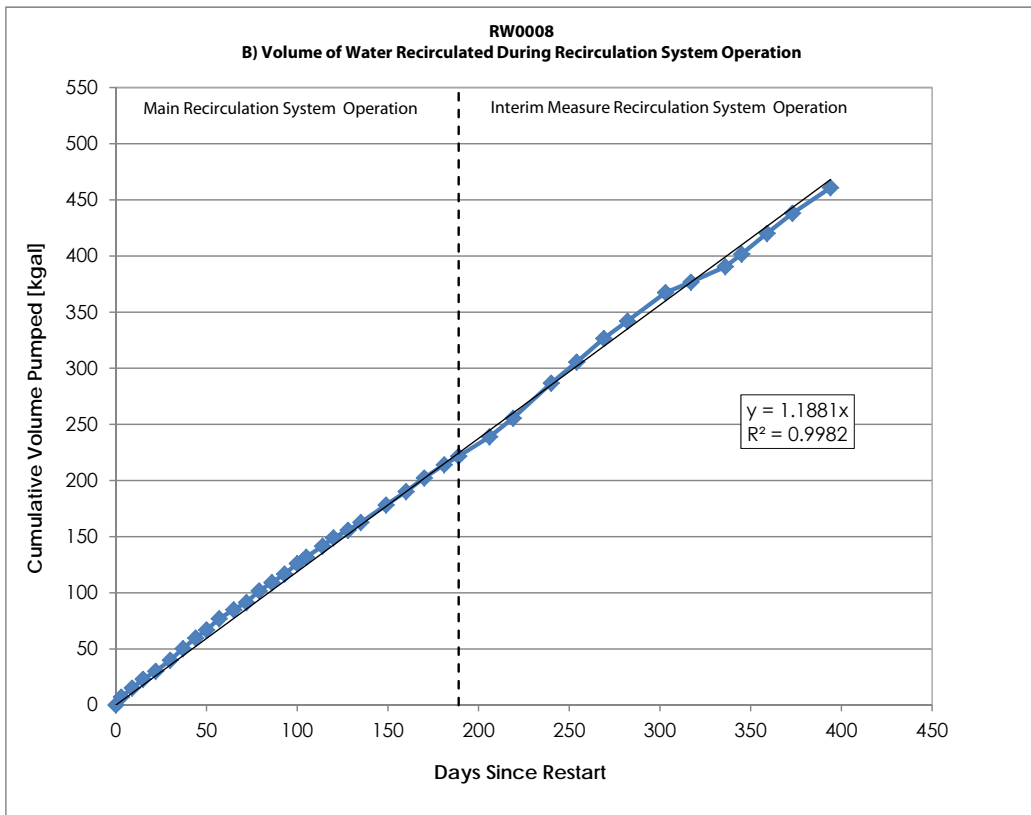
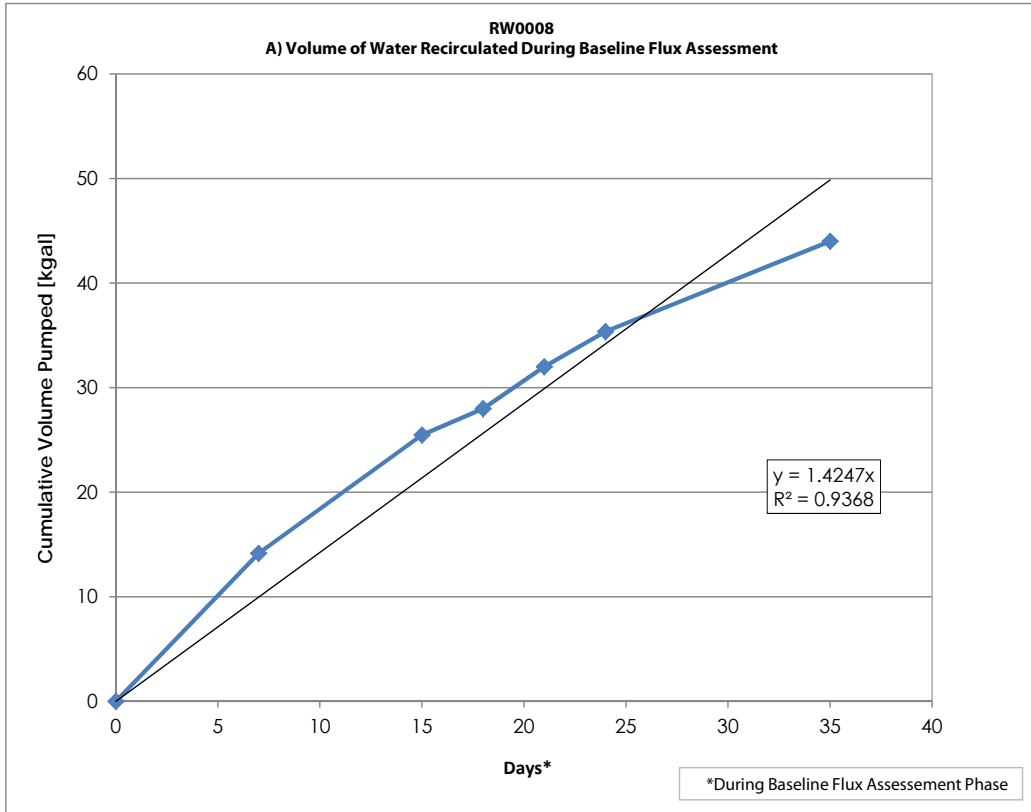
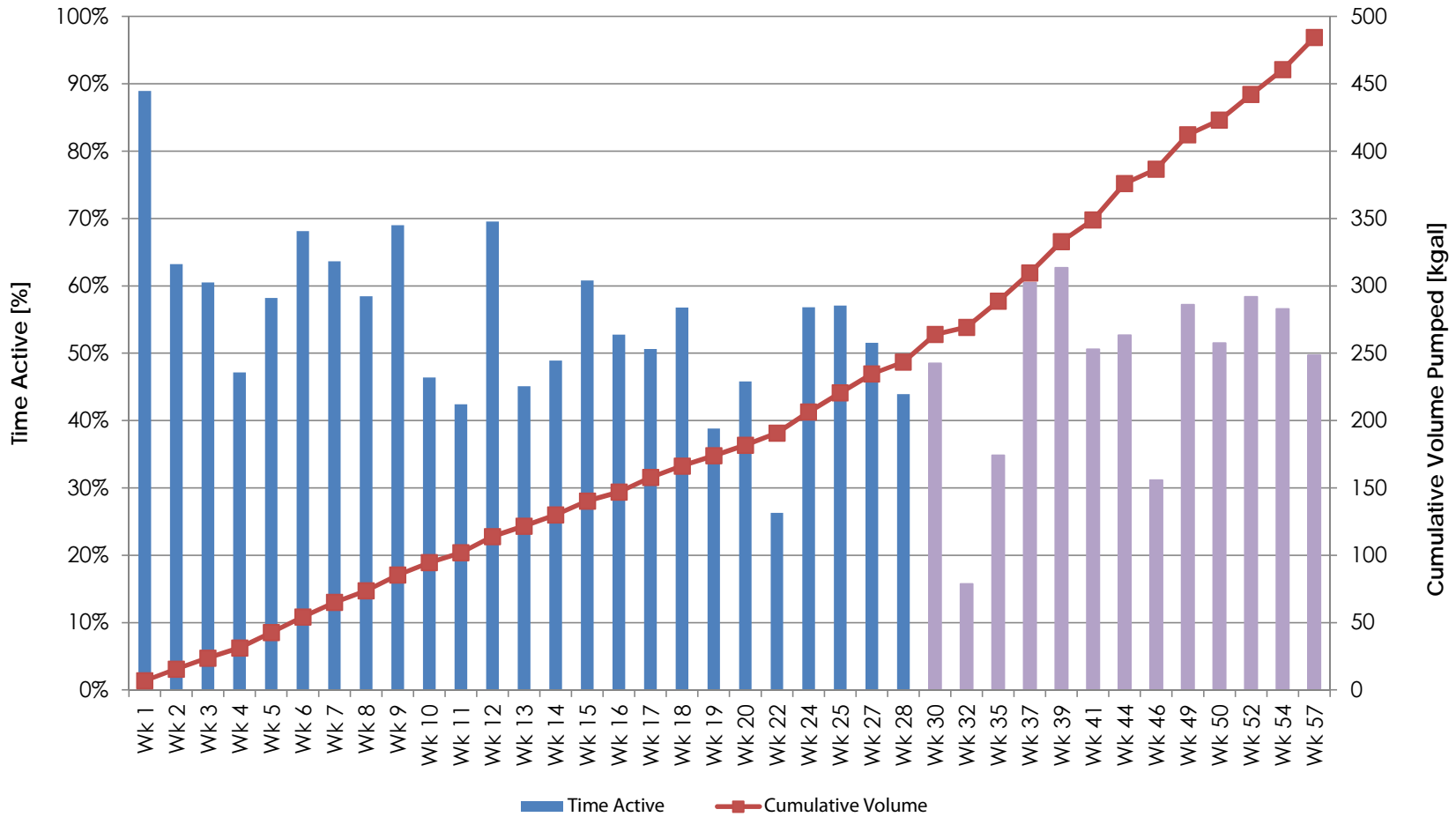


FIGURE C-2
VOLUME OF GROUNDWATER RECIRCULATED IN LOWER ZONE (RW0008)

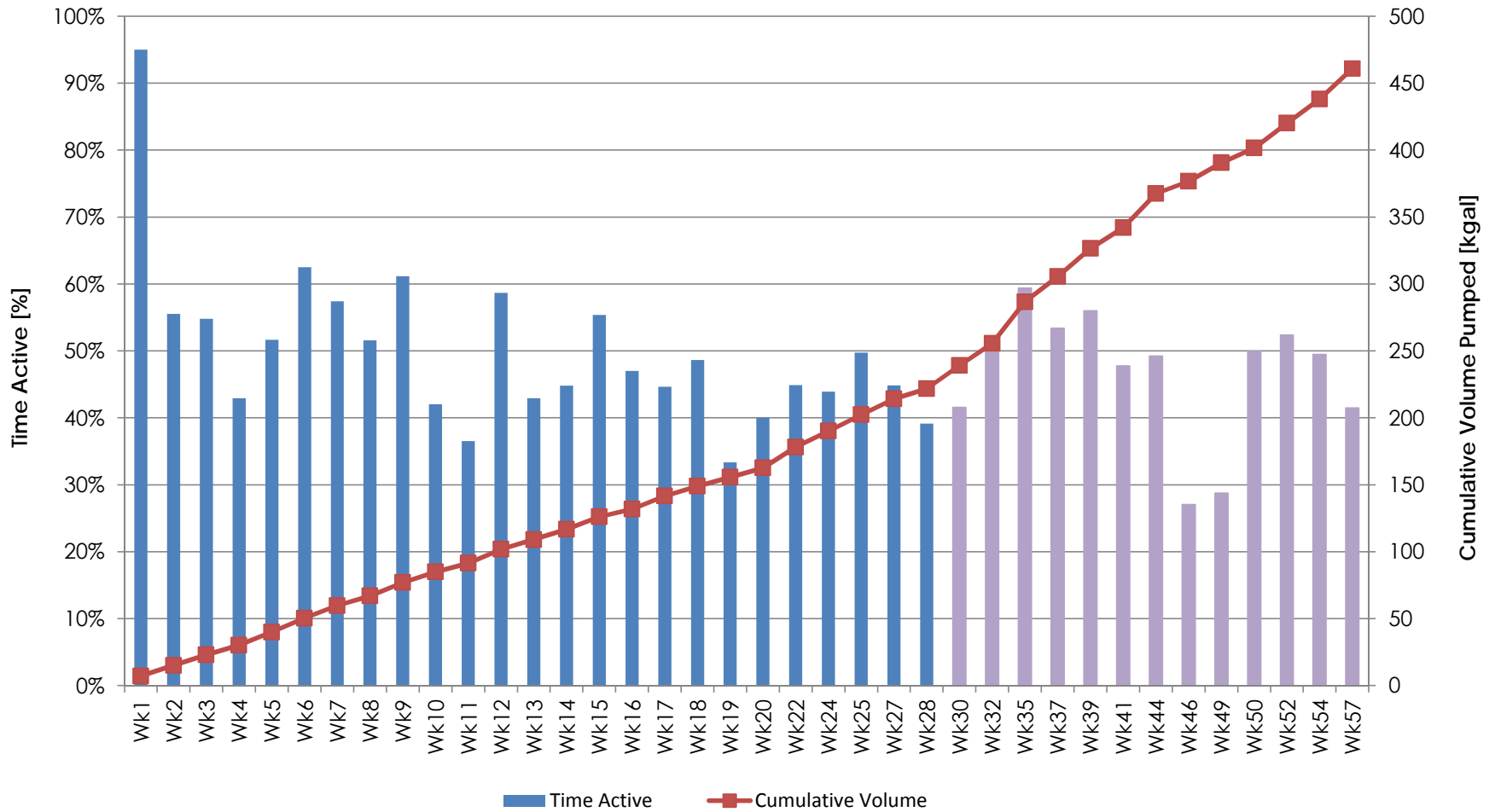




Notes:

1. Time Active represents the portion of the day in which the system operated. During this time, the pump cycled 40 minutes on, 20 minutes off.
2. The first 28 weeks (blue bars) represent the Main Recirculation System Operation Phase and subsequent weeks (purple bars) represent the Interim Measure Recirculation System Operation Phase.
3. Readings are not evenly distributed over time; less frequent recordings at later time create appearance of greater pumping rate (slope).

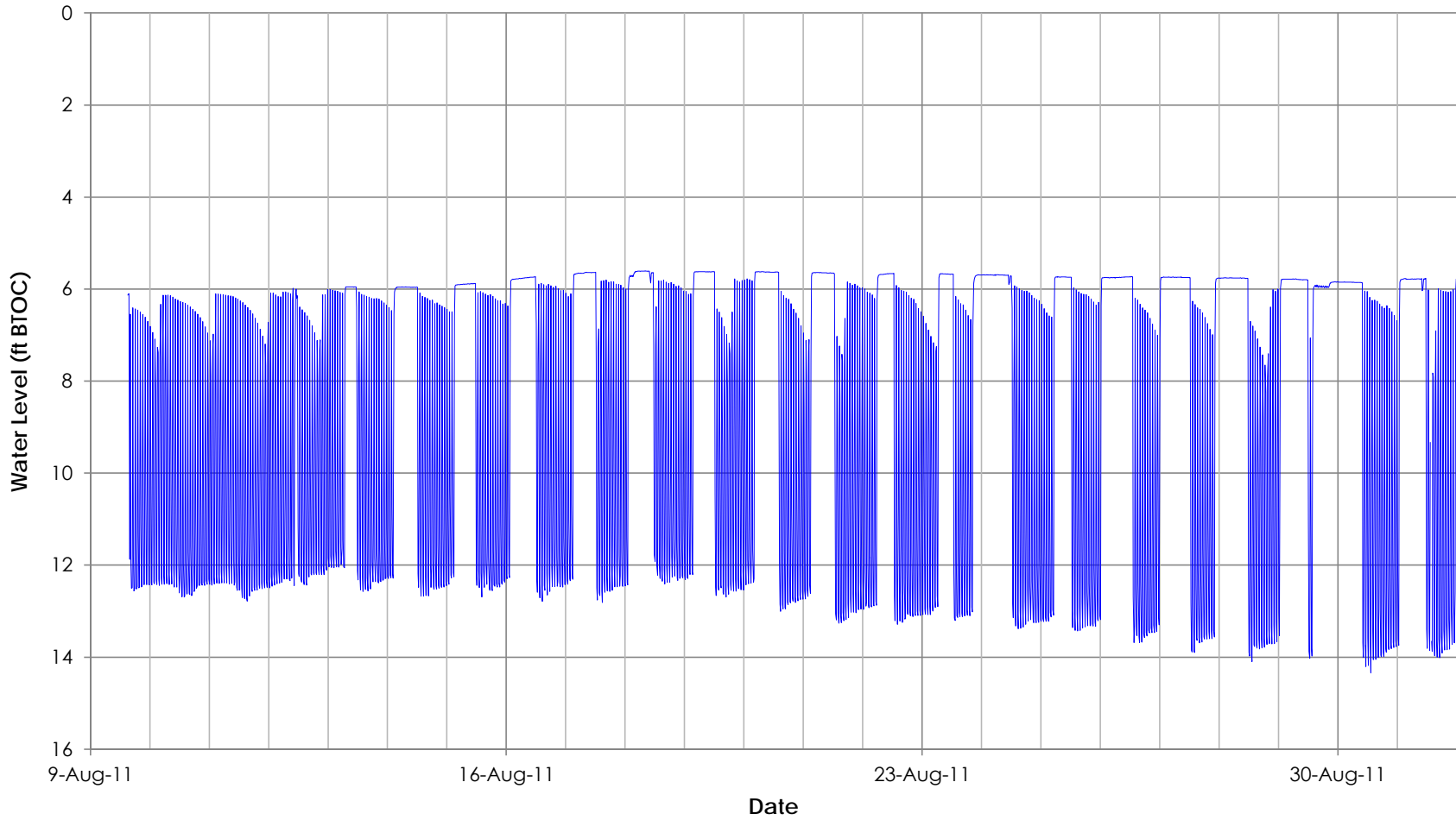
RW0007 Operating History	
Launch Complex 34, Cape Canaveral, FL	
Figure C-3	
Guelph	October 2013



Notes:

1. Time Active represents the portion of the day in which the system operated. During this time, the pump cycled 40 minutes on, 20 minutes off.
2. The first 28 weeks (blue bars) represent the Main Recirculation System Operation Phase and subsequent weeks (purple bars) represent the Interim Measure Recirculation System Operation Phase.
3. Readings are not evenly distributed over time; less frequent recordings at later time create appearance of greater pumping rate (slope).

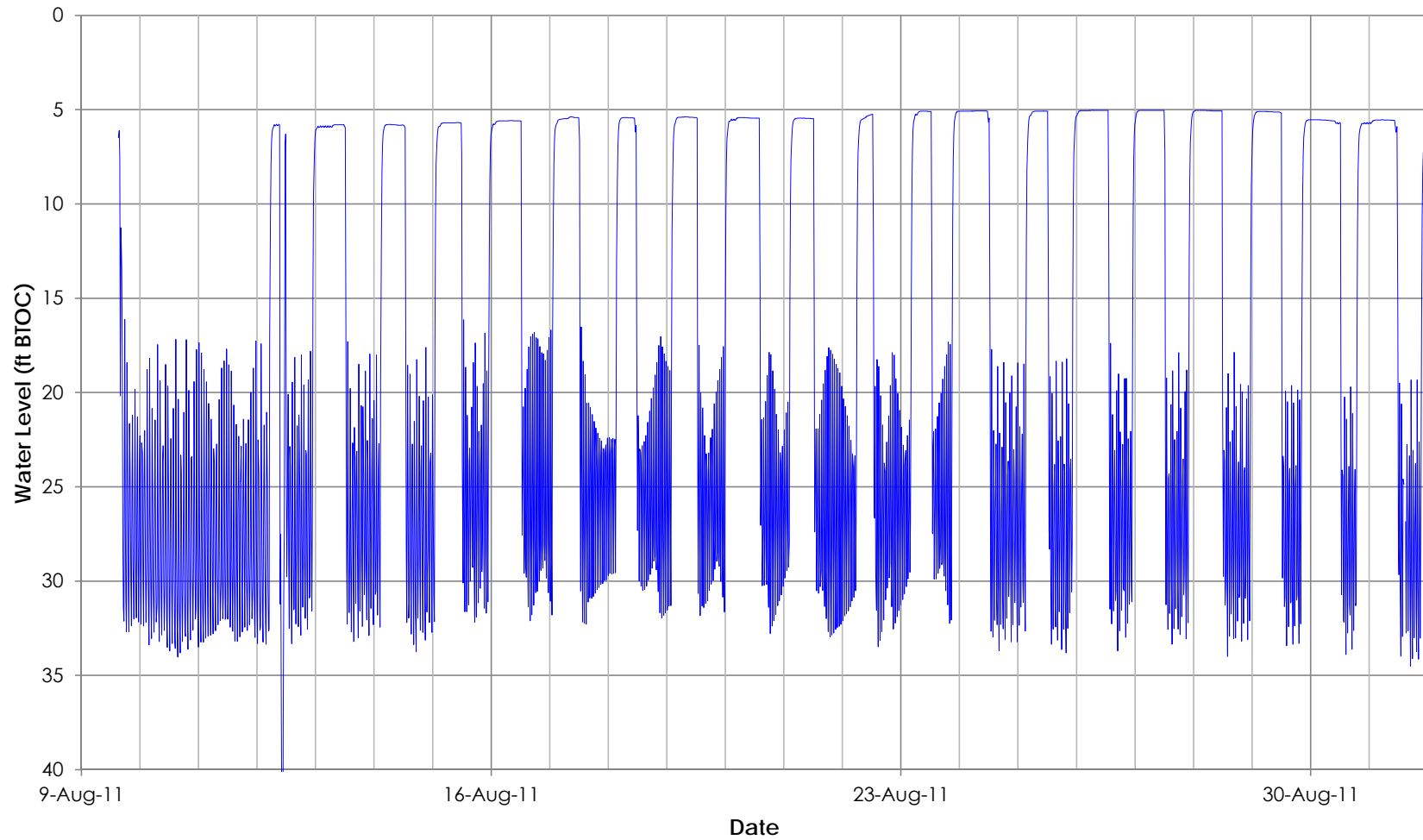
RW0008 Operating History		Figure C-4
Launch Complex 34, Cape Canaveral, FL		
Guelph	October 2013	



Notes:

1. Data for first month of the Main Recirculation Phase is presented here. Additional data is presented in Attachment C-4 in Appendix C.
 2. Vertical grid lines mark the start of a new day (12:00 midnight)
- ft BTOC - feet below top of casing

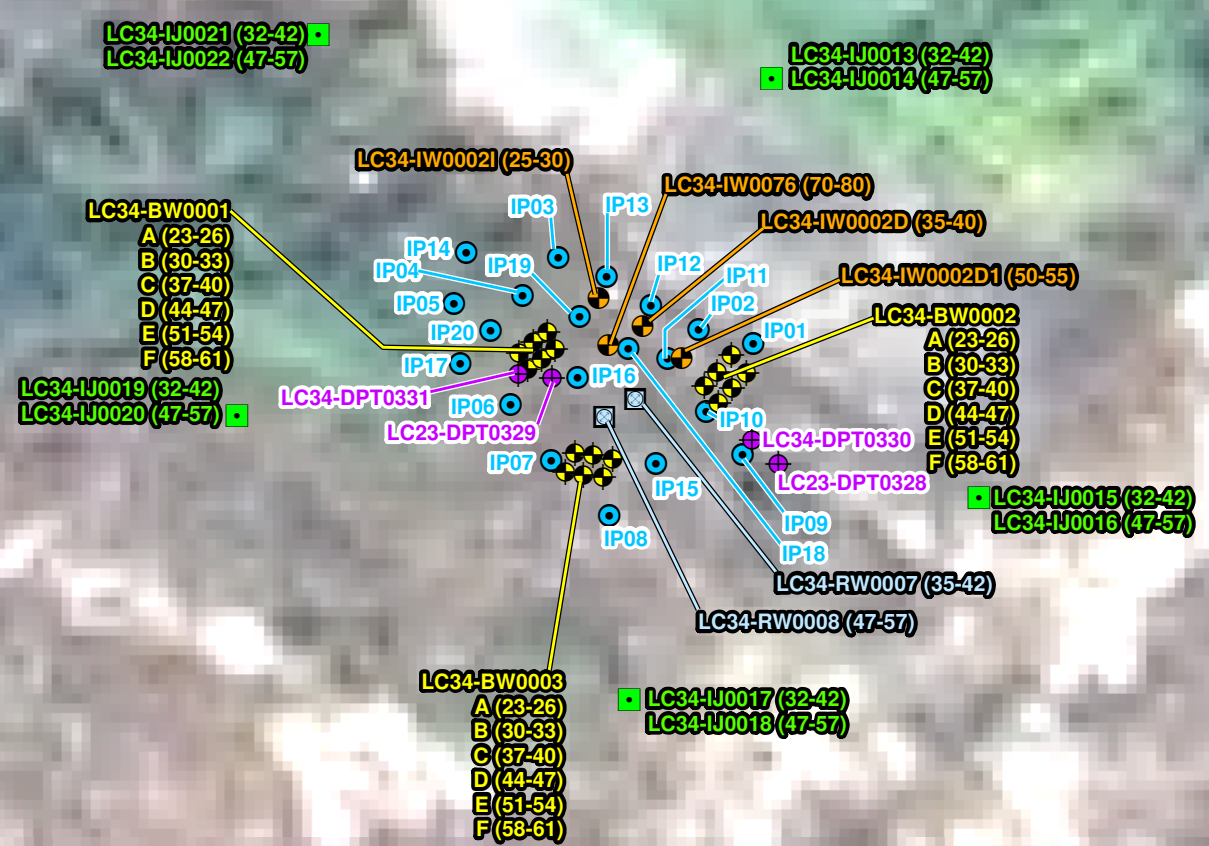
Water Level at Upper Extraction Well (RW0007)	
Hot Spot 1, LC34, Cape Canaveral, FL ESTCP Project ER-0716	
	Figure
	C-5
Guelph	October 2013



Notes

1. Data for first month of the Main Recirculation Phase is presented here.
Additional data is presented in Attachment C-4 in Appendix C.
 2. Vertical grid lines mark the start of a new day (12:00 midnight)
- ft BTOC - feet below top of casing

Water Level at Lower Extraction Well (RW0008) Hot Spot 1, LC34, Cape Canaveral, FL ESTCP Project ER-0716	
Figure C-6	
Guelph	October 2013

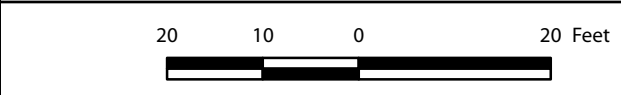


Legend

- DPT Groundwater Sampling Location (June 2011)
- Bundle Well Location
- Monitoring Well Location
- Extraction Well Location
- Injection Well Pair Location
- PED Injection Point Location

Well Identifier Screen Interval (ft BLS)

Notes:
 1. ft BLS indicates feet below land surface.
 2. PED indicates Partitioning Electron Donor.



Injection Confirmation Monitoring Locations
 Hot Spot 1, LC34, Cape Canaveral, FL / ESTCP Project ER-0716

Geosyntec
 consultants

Guelph April 2013

Figure C-7

Path: (T:\uville-01\DATA) T:\GIS\FC0552\MXD\ESTCP_MAR2013\PED_III_CPR_Loc.mxd 05 April 2013 MAH

ATTACHMENT C-1
VIRONEX INJECTION REPORT

Injection Services Report

Prepared for:



Prepared by:



LC-34

Cape Canaveral, FL

June 20, 2011 - June 28, 2011

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Project Summary

Project Name: LC-34

Project Dates: June 20, 2011 - June 28, 2011

Manpower: Mike Mazzaresse (Project Manager); Austin Hittinger (Field Tech);
Jacob Haldiman (Field Tech); George Lujan (National Director of Safety)

Equipment: One (1) Custom Vironex Remediation Platform, One (1) Support Truck and Trailer

Proposed SOW: Vironex will inject 34,000 gallons of n-Butyl Acetate solution (3,000 mg/L) into 20 locations over a 40 ft injection interval (23 ft to 63 ft bgs). Potassium Bromide (60 mg/L) and Potassium Iodide (140 mg/L) will be added to the injection solutions as specified in the RFP (Bromide in all injection solutions, Iodide in injection solution above the clay layer only).

Project Summary: Injection services were initiated on Monday June 20, 2011. Upon arrival to the site Vironex set up a containment pad and ran hoses for the remediation platform. The platform and mixing totes were grounded due to the explosiveness of the reagent that was being injected. Prior to the injections, a water test was performed to check the line pressure and ensure that there were no leaks in the remediation system. Vironex sustained flow rates between 6 and 8 gpm while averaging 30 to 45 psi throughout the injection process. During this event there were two locations that had to be slowed down due to rising water levels in adjacent monitoring wells: location IP-0011 due to response in IW-0002D1 and location IP – 0018 due to response in RW-0008. This injection event was successfully completed on Tuesday June 28, 2011, one day ahead of schedule.

Injection Summary

**Site LC34 - Cape Canaveral, FL
Injection Summary**

	Date	Total nBA Injected (Gal)	Total KBr Injected (g)	Total KI Injected (g)	Total H2O Injected (Gal)	Total Volume Injected (Gal)	Points Completed
Monday	6/20/11	5.8	578.0	1173.0	1694.0	1700.0	1.0
Tuesday	6/21/11	14.4	1445.0	1760.0	4236.0	4250.0	2.5
Wednesday	6/22/11	17.4	1734.0	1759.0	5082.5	5100.0	3.0
Thursday	6/23/11	17.4	1734.0	1759.5	5082.5	5100.0	3.0
Friday	6/24/11	23.1	2318.8	1759.5	6797.0	6820.0	4.0
Monday	6/27/11	20.2	2016.2	1759.0	5910.0	5930.0	3.5
Tuesday	6/28/11	16.7	1734.0	1760.0	5082.0	5100.0	3.0
	Design	115.0	11560.0	11730.0	33885.0	34000.0	20.0
	Injected	115.0	11560.0	11730.0	33884.0	34000.0	20.0
	Daily Average	16.4	1651.4	1675.7	4840.6	4857.1	2.7

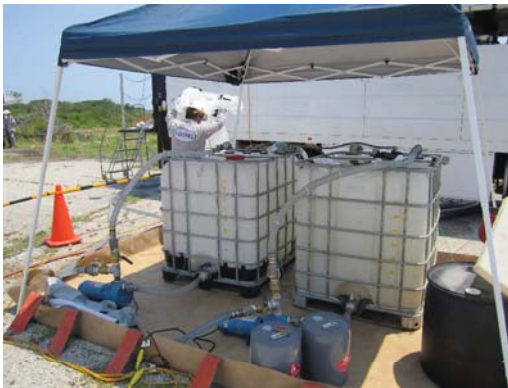
Project Photographs



Site Set-up and Tailgate meeting



2 ft Injection tool during water test



Mixing totes and transfer pumps



n Butyl Acetate drum pump in protective vapor shield



Well box locations in the injection area



Injection area

Project Photographs



Injection Rig



Rig Platform



*Transfer Line Manifold on top of
Progressive Cavity Pump*



5 Point Injection Manifold



Gram scale for tracer measurements



Gram Scale

Project Photographs



*Copper spike for injection rig
grounding wire*



Bonding location on injection Rig



Bonding locations on mixing totes



*Bonding locations on drum pump and
transfer pump*



Transfer Pump bonding location



n Butyl Acetate 5 gal. steel drums

Appendix A - Injection Logs

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0001	6/20/11	2:06 PM	6/20/11	2:20 PM	2.0	23'-25'	85	85	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	2:20 PM	6/20/11	2:35 PM	2.0	25'-27'	85	170	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	2:35 PM	6/20/11	2:50 PM	2.0	27'-29'	85	255	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:35 PM	6/20/11	3:50 PM	2.0	29'-31'	85	340	25	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:50 PM	6/20/11	4:05 PM	2.0	31'-33'	85	425	25	6.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/20/11	4:05 PM	6/20/11	4:20 PM	2.0	33'-35'	85	510	30	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	4:20 PM	6/20/11	4:35 PM	2.0	35'-37'	85	595	30	6.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/20/11	4:35 PM	6/20/201	4:50 PM	2.0	36.5'-38.5'	85	680	30	6.0	0.289	28.9	58.7	84.7	85	Correct the depth error by completing three 1.5 ft pushes to bring the final depth of the day to 41.5 feet bgs.
	6/20/11	4:50 PM	6/20/11	5:05 PM	2.0	38'-41'	85	765	35	6.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/20/11	5:05 PM	6/20/11	5:08 PM	2.0	39.5'-41.5'	85	850	35	6.0	0.289	28.9	58.7	84.7	85	
	6/21/11	7:50 AM	6/21/11	8:05 AM	2.0	42'-44'	85	935	30	5.8	0.289	28.9		84.7	85	First interval with no Potassium Iodide. First push of the day was 2.5ft to get back onto the target depth.
Total H2O (gal) 1694.2	6/21/11	8:05 AM	6/21/11	8:20 AM	2.0	44'-46'	85	1,020	38	6.0	0.289	28.9		84.7	85	
	6/21/11	8:20 AM	6/21/11	8:35 AM	2.0	46'-48'	85	1,105	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/21/11	8:35 AM	6/21/11	8:50 AM	2.0	48'-50'	85	1,190	40	6.0	0.289	28.9		84.7	85	Increased flow rates.
	6/21/11	8:50 AM	6/21/11	9:05 AM	2.0	50'-52'	85	1,275	50	8.0	0.289	28.9		84.7	85	
	6/21/11	9:05 AM	6/21/11	9:15 AM	2.0	52'-54'	85	1,360	48	8.2	0.289	28.9		84.7	85	
	6/21/11	9:15 AM	6/21/11	9:25 AM	2.0	54'-56'	85	1,445	45	8.0	0.289	28.9		84.7	85	
	6/21/11	9:25 AM	6/21/11	9:35 AM	2.0	56'-58'	85	1,530	45	8.0	0.289	28.9		84.7	85	
IP-0002	6/20/11	2:40 PM	6/20/11	3:00 PM	2.0	23'-25'	85	85	18	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:00 PM	6/20/11	3:15 PM	2.0	25'-27'	85	170	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:15 PM	6/20/11	3:30 PM	2.0	27'-29'	85	255	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:30 PM	6/20/11	3:45 PM	2.0	29'-31'	85	340	20	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	3:45 PM	6/20/11	4:00 PM	2.0	31'-33'	85	425	22	6.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/20/11	4:00 PM	6/20/11	4:15 PM	2.0	33'-35'	85	510	25	6.0	0.289	28.9	58.7	84.7	85	
	6/20/11	4:15 PM	6/20/11	4:30 PM	2.0	35'-37'	85	595	30	6.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/20/11	4:30 PM	6/20/11	4:45 PM	2.0	36.5'-38.5'	85	680	30	6.0	0.289	28.9	58.7	84.7	85	Correct the depth error by completing three 1.5 ft pushes to bring the final depth of the day to 41.5 feet bgs.
	6/20/11	4:45 PM	6/20/11	5:00 PM	2.0	38'-41'	85	765	40	6.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/20/11	5:00 PM	6/20/11	5:08 PM	2.0	39.5'-41.5'	85	850	40	6.0	0.289	28.9	58.7	84.7	85	
	6/21/11	7:50 AM	6/21/11	8:05 AM	2.0	42'-44'	85	935	20	6.0	0.289	28.9		84.7	85	First interval with no Potassium Iodide. First push of the day was 2.5ft to get back onto the target depth.
Total H2O (gal) 1694.2	6/21/11	8:05 AM	6/21/11	8:20 AM	2.0	44'-46'	85	1,020	15	6.0	0.289	28.9		84.7	85	
	6/21/11	8:20 AM	6/21/11	8:35 AM	2.0	46'-48'	85	1,105	18	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/21/11	8:35 AM	6/21/11	8:50 AM	2.0	48'-50'	85	1,190	20	6.0	0.289	28.9		84.7	85	Increased flow rates.
	6/21/11	8:50 AM	6/21/11	9:05 AM	2.0	50'-52'	85	1,275	30	8.0	0.289	28.9		84.7	85	
	6/21/11	9:05 AM	6/21/11	9:15 AM	2.0	52'-54'	85	1,360	45	8.3	0.289	28.9		84.7	85	
	6/21/11	9:15 AM	6/21/11	9:25 AM	2.0	54'-56'	85	1,445	45	8.0	0.289	28.9		84.7	85	
	6/21/11	9:25 AM	6/21/11	9:35 AM	2.0	56'-58'	85	1,530	40	8.0	0.289	28.9		84.7	85	
Total Volume 1700	6/21/11	9:35 AM	6/21/11	9:45 AM	2.0	58'-60'	85	1,615	45	8.0	0.289	28.9		84.7	85	
	6/21/11	9:45 AM	6/21/11	9:55 AM	2.0	60'-62'	85	1,700	40	8.0	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0003	6/21/11	11:35 AM	6/21/11	11:50 AM	2.0	23'-25'	85	85	22	6.0	0.289	28.9	58.7	84.7	85	
	6/21/11	11:50 AM	6/21/11	12:05 PM	2.0	25'-27'	85	170	25	6.0	0.289	28.9	58.7	84.7	85	
	6/21/11	12:05 PM	6/21/11	12:20 PM	2.0	27'-29'	85	255	25	6.0	0.289	28.9	58.7	84.7	85	Took lunch after this interval.
	6/21/11	1:00 PM	6/21/11	1:10 PM	2.0	29'-31'	85	340	35	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:10 PM	6/21/11	1:20 PM	2.0	31'-33'	85	425	35	8.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/21/11	1:20 PM	6/21/11	1:30 PM	2.0	33'-35'	85	510	40	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:30 PM	6/21/11	1:40 PM	2.0	35'-37'	85	595	38	8.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/21/11	1:40 PM	6/21/11	1:50 PM	2.0	37'-39'	85	680	38	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:55 PM	6/21/11	3:00 PM	2.0	39'-41'	85	765	35	8.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/21/11	3:00 PM	6/21/11	3:10 PM	2.0	40'-42'	85	850	35	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
	6/22/11	7:40 AM	6/22/11	8:10 AM	2.0	42'-44'	85	935	55	7.5	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/22/11	8:10 AM	6/22/11	8:35 AM	2.0	44'-46'	85	1,020	35	5.8	0.289	28.9		84.7	85	
	6/22/11	8:35 AM	6/22/11	8:55 AM	2.0	46'-48'	85	1,105	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	8:55 AM	6/22/11	9:20 AM	2.0	48'-50'	85	1,190	40	6.0	0.289	28.9		84.7	85	
	6/22/11	9:20 AM	6/22/11	9:50 AM	2.0	50'-52'	85	1,275	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	9:50 AM	6/22/11	10:25 AM	2.0	52'-54'	85	1,360	40	6.0	0.289	28.9		84.7	85	
	6/22/11	10:25 AM	6/22/11	10:50 AM	2.0	54'-56'	85	1,445	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	10:50 AM	6/22/11	11:15 AM	2.0	56'-58'	85	1,530	42	6.5	0.289	28.9		84.7	85	
	6/22/11	11:15 AM	6/22/11	11:35 AM	2.0	58'-60'	85	1,615	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	11:35 AM	6/22/11	12:00 PM	2.0	60'-62'	85	1,700	45	6.0	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.
	6/21/11	11:35 AM	6/21/11	11:50 AM	2.0	23'-25'	85	85	22	6.0	0.289	28.9	58.7	84.7	85	
IP-0004	6/21/11	11:50 AM	6/21/11	12:05 PM	2.0	25'-27'	85	170	25	6.0	0.289	28.9	58.7	84.7	85	
	6/21/11	12:05 PM	6/21/11	12:20 PM	2.0	27'-29'	85	255	25	6.0	0.289	28.9	58.7	84.7	85	Took lunch between these intervals.
	6/21/11	1:00 PM	6/21/11	1:10 PM	2.0	29'-31'	85	340	35	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:10 PM	6/21/11	1:20 PM	2.0	31'-33'	85	425	35	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:20 PM	6/21/11	1:30 PM	2.0	33'-35'	85	510	40	8.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/21/11	1:30 PM	6/21/11	1:40 PM	2.0	35'-37'	85	595	38	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	1:40 PM	6/21/11	1:50 PM	2.0	37'-39'	85	680	38	8.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/21/11	1:55 PM	6/21/11	3:00 PM	2.0	39'-41'	85	765	35	8.0	0.289	28.9	58.7	84.7	85	
	6/21/11	3:00 PM	6/21/11	3:10 PM	2.0	40'-42'	85	850	35	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
Total KI (g) 586.5	6/22/11	7:40 AM	6/22/11	8:10 AM	2.0	42'-44'	85	935	60	7.0	0.289	28.9		84.7	85	
	6/22/11	8:10 AM	6/22/11	8:35 AM	2.0	44'-46'	85	1,020	40	5.5	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/22/11	8:35 AM	6/22/11	8:55 AM	2.0	46'-48'	85	1,105	40	6.0	0.289	28.9		84.7	85	
	6/22/11	8:55 AM	6/22/11	9:20 AM	2.0	48'-50'	85	1,190	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	9:20 AM	6/22/11	9:50 AM	2.0	50'-52'	85	1,275	40	6.0	0.289	28.9		84.7	85	
	6/22/11	9:50 AM	6/22/11	10:25 AM	2.0	52'-54'	85	1,360	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	10:25 AM	6/22/11	10:50 AM	2.0	54'-56'	85	1,445	40	6.3	0.289	28.9		84.7	85	
	6/22/11	10:50 AM	6/22/11	11:15 AM	2.0	56'-58'	85	1,530	40	6.3	0.289	28.9		84.7	85	
Total Volume 1700	6/22/11	11:15 AM	6/22/11	11:35 AM	2.0	58'-60'	85	1,615	40	6.0	0.289	28.9		84.7	85	
	6/22/11	11:35 AM	6/22/11	12:00 PM	2.0	60'-62'	85	1,700	40	6.0	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0005	6/21/11	3:45 PM	6/21/11	4:30 PM	5.0	23'-28'	213	213	40	8.0	0.724	72.4	147.0	212.3	213	5 ft. injection tool.
	6/21/11	4:30 PM	6/21/11	5:15 PM	5.0	28'-33'	212	425	40	8.0	0.721	72.1	146.3	211.3	212	
	6/21/11	5:15 PM	6/21/11	6:00 PM	5.0	33'-38'	213	637	40	8.0	0.724	72.4	147.0	212.3	213	
	6/21/11	6:00 PM	6/21/11	6:45 PM	5.0	37'-42'	212	850	40	8.0	0.721	72.1	146.3	211.3	212	4 ft. push to inject in the interval above the clay layer.
	6/22/11	7:35 AM	6/22/11	8:35 AM	5.0	42'-47'	213	1,062	55	6.0	0.721	72.1		211.3	212	
	6/22/11	8:35 AM	6/22/11	9:50 AM	5.0	47'-52'	212	1,275	45	6.5	0.724	72.4		212.3	213	
	6/22/11	9:50 AM	6/22/11	10:50 AM	5.0	52'-57'	213	1,487	50	6.5	0.721	72.1		211.3	212	
	6/22/11	10:50 AM	6/22/11	11:50 AM	5.0	57'-62'	212	1,700	45	6.5	0.724	72.4		212.3	213	Successfully completed location. Chased with 10 gal. Flush water.
	Total nBA (gal)															
	5.8															
Total KBr (g)																
578.0																
Total KI (g)																
586.5																
Total H2O (gal)																
1694.2																
Total Volume																
1700																
IP-0006	6/22/11	2:50 PM	6/22/11	3:25 PM	2.0	23'-25'	85	85	10	3.0	0.289	28.9	58.7	84.7	85	Pumped slow to allow the other location to catch up.
	6/22/11	3:25 PM	6/22/11	3:35 PM	2.0	25'-27'	85	170	35	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:35 PM	6/22/11	3:45 PM	2.0	27'-29'	85	255	40	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:45 PM	6/22/11	3:55 PM	2.0	29'-31'	85	340	50	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:55 PM	6/22/11	4:05 PM	2.0	31'-33'	85	425	45	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:05 PM	6/22/11	4:25 PM	2.0	33'-35'	85	510	40	6.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:25 PM	6/22/11	4:40 PM	2.0	35'-37'	85	595	40	6.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:40 PM	6/22/11	4:55 PM	2.0	37'-39'	85	680	35	6.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:55 PM	6/22/11	5:10 PM	2.0	39'-41'	85	765	55	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	5:10 PM	6/22/11	5:25 PM	2.0	40'-42'	85	850	55	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
	6/23/11	7:40 AM	6/23/11	7:50 AM	2.0	42'-44'	85	935	45	8.5	0.289	28.9		84.7	85	
	6/23/11	7:50 AM	6/23/11	8:05 AM	2.0	44'-46'	85	1,020	50	7.0	0.289	28.9		84.7	85	
	6/23/11	8:05 AM	6/23/11	11:50 AM	2.0	46'-48'	85	1,105	35	5.0	0.289	28.9		84.7	85	
	6/23/11	11:50 AM	6/23/11	12:00 PM	2.0	48'-50'	85	1,190	50	8.5	0.289	28.9		84.7	85	
	6/23/11	12:00 PM	6/23/11	12:15 PM	2.0	50'-52'	85	1,275	45	7.0	0.289	28.9		84.7	85	
	6/23/11	12:15 PM	6/23/11	12:25 PM	2.0	52'-54'	85	1,360	50	8.5	0.289	28.9		84.7	85	
	6/23/11	12:25 PM	6/23/11	12:35 PM	2.0	54'-56'	85	1,445	50	8.5	0.289	28.9		84.7	85	
6/23/11	12:35 PM	6/23/11	12:45 PM	2.0	56'-58'	85	1,530	50	8.5	0.289	28.9		84.7	85		
6/23/11	12:45 PM	6/23/11	12:55 PM	2.0	58'-60'	85	1,615	50	8.5	0.289	28.9		84.7	85		
6/23/11	12:55 PM	6/23/11	1:10 PM	2.0	60'-62'	85	1,700	50	8.0	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.	
Total KBr (g)																
578.0																
Total KI (g)																
586.5																
Total H2O (gal)																
1694.2																
Total Volume																
1700																

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0007	6/22/11	3:00 PM	6/22/11	3:25 PM	2.0	23'-25'	85	85	35	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:25 PM	6/22/11	3:35 PM	2.0	25'-27'	85	170	35	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:35 PM	6/22/11	3:45 PM	2.0	27'-29'	85	255	40	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:45 PM	6/22/11	3:55 PM	2.0	29'-31'	85	340	45	8.0	0.289	28.9	58.7	84.7	85	
	6/22/11	3:55 PM	6/22/11	4:05 PM	2.0	31'-33'	85	425	45	8.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/22/11	4:05 PM	6/22/11	4:25 PM	2.0	33'-35'	85	510	40	6.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:25 PM	6/22/11	4:40 PM	2.0	35'-37'	85	595	40	6.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/22/11	4:40 PM	6/22/11	4:55 PM	2.0	37'-39'	85	680	35	6.0	0.289	28.9	58.7	84.7	85	
	6/22/11	4:55 PM	6/22/11	5:10 PM	2.0	39'-41'	85	765	55	8.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/22/11	5:10 PM	6/22/11	5:25 PM	2.0	40'-42'	85	850	55	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
	6/23/11	7:40 AM	6/23/11	7:50 AM	2.0	42'-44'	85	935	38	8.0	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/23/11	7:50 AM	6/23/11	8:05 AM	2.0	44'-46'	85	1,020	45	7.0	0.289	28.9		84.7	85	
	6/23/11	8:05 AM	6/23/11	11:50 AM	2.0	46'-48'	85	1,105	35	5.0	0.289	28.9		84.7	85	
Total Volume 1700	6/23/11	11:50 AM	6/23/11	12:00 PM	2.0	48'-50'	85	1,190	50	8.5	0.289	28.9		84.7	85	
	6/23/11	12:00 PM	6/23/11	12:15 PM	2.0	50'-52'	85	1,275	45	7.0	0.289	28.9		84.7	85	
Total nBA (gal) 5.8	6/23/11	12:15 PM	6/23/11	12:25 PM	2.0	52'-54'	85	1,360	50	8.5	0.289	28.9		84.7	85	
	6/23/11	12:25 PM	6/23/11	12:35 PM	2.0	54'-56'	85	1,445	50	8.5	0.289	28.9		84.7	85	
Total KBr (g) 578.0	6/23/11	12:35 PM	6/23/11	12:45 PM	2.0	56'-58'	85	1,530	50	8.5	0.289	28.9		84.7	85	
	6/23/11	12:45 PM	6/23/11	12:55 PM	2.0	58'-60'	85	1,615	50	8.5	0.289	28.9		84.7	85	
Total KI (g) 586.5	6/23/11	12:55 PM	6/23/11	1:10 PM	2.0	60'-62'	85	1,700	50	8.0	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.
	6/22/11	2:40 PM	6/22/11	3:25 PM	5.0	23'-28'	213	213	35	8.0	0.724	72.4	147.0	212.3	213	5 ft. injection tool.
Total H2O (gal) 1694.2	6/22/11	3:25 PM	6/22/11	3:50 PM	5.0	28'-33'	212	426	45	8.5	0.721	72.1	146.3	211.3	212	
	6/22/11	3:50 PM	6/22/11	4:05 PM	5.0	33'-38'	213	638	50	8.5	0.724	72.4	147.0	212.3	213	
Total Volume 1700	6/22/11	4:05 PM	6/22/11	4:45 PM	5.0	37'-42'	212	851	50	8.5	0.721	72.1	146.3	211.3	212	4 ft. push to inject in the interval above the clay layer.
	6/23/11	7:40 AM	6/23/11	8:05 AM	5.0	42'-47'	213	1,063	40	8.0	0.721	72.1		211.3	212	
Total nBA (gal) 5.8	6/23/11	8:05 AM	6/23/11	12:05 PM	5.0	47'-52'	212	1,276	40	8.5	0.724	72.4		212.3	213	
	6/23/11	12:05 PM	6/23/11	1:00 PM	5.0	52'-57'	212	1,488	8	3.5	0.724	72.4		212.3	213	
Total KBr (g) 578.0	6/23/11	1:00 PM	6/23/11	1:30 PM	5.0	57'-62'	212	1,700	35	7.0	0.721	72.1		211.3	212	Successfully completed location. Chased with 10 gal. Flush water.
	6/23/11	1:30 PM	6/23/11													
Total KI (g) 586.5																
Total H2O (gal) 1694.2																
Total Volume 1700																

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0009	6/23/11	3:15 PM	6/23/11	3:40 PM	2.0	23'-25'	85	85	40	7.5	0.289	28.9	58.7	84.7	85	
	6/23/11	3:40 PM	6/23/11	3:50 PM	2.0	25'-27'	85	170	38	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	3:50 PM	6/23/11	4:00 PM	2.0	27'-29'	85	255	42	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:00 PM	6/23/11	4:10 PM	2.0	29'-31'	85	340	50	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:10 PM	6/23/11	4:20 PM	2.0	31'-33'	85	425	45	8.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/23/11	4:20 PM	6/23/11	4:30 PM	2.0	33'-35'	85	510	45	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:30 PM	6/23/11	4:40 PM	2.0	35'-37'	85	595	45	8.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/23/11	4:40 PM	6/23/11	4:50 PM	2.0	37'-39'	85	680	45	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:50 PM	6/23/11	5:00 PM	2.0	39'-41'	85	765	45	8.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/23/11	5:00 PM	6/23/11	5:10 PM	2.0	40'-42'	85	850	45	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
	6/24/11	7:20 AM	6/24/11	7:35 AM	2.0	42'-44'	85	935	38	6.0	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/24/11	7:35 AM	6/24/11	7:50 AM	2.0	44'-46'	85	1,020	40	6.0	0.289	28.9		84.7	85	
	6/24/11	7:50 AM	6/24/11	8:00 AM	2.0	46'-48'	85	1,105	40	6.5	0.289	28.9		84.7	85	
Total Volume 1700	6/24/11	8:00 AM	6/24/11	8:10 AM	2.0	48'-50'	85	1,190	45	6.0	0.289	28.9		84.7	85	
	6/24/11	8:10 AM	6/24/11	8:20 AM	2.0	50'-52'	85	1,275	50	8.4	0.289	28.9		84.7	85	
	6/24/11	8:20 AM	6/24/11	8:30 AM	2.0	52'-54'	85	1,360	50	8.5	0.289	28.9		84.7	85	
	6/24/11	8:30 AM	6/24/11	8:40 AM	2.0	54'-56'	85	1,445	50	8.5	0.289	28.9		84.7	85	
	6/24/11	8:40 AM	6/24/11	8:50 AM	2.0	56'-58'	85	1,530	45	8.5	0.289	28.9		84.7	85	
Total Volume 1700	6/24/11	8:50 AM	6/24/11	9:00 AM	2.0	58'-60'	85	1,615	45	8.5	0.289	28.9		84.7	85	
	6/24/11	9:00 AM	6/24/11	9:20 AM	2.0	60'-62'	85	1,700	45	8.5	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.
IP-0010	6/23/11	3:05 PM	6/23/11	3:45 PM	2.0	23'-25'	85	85	40	7.5	0.289	28.9	58.7	84.7	85	
	6/23/11	3:45 PM	6/23/11	3:55 PM	2.0	25'-27'	85	170	40	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	3:55 PM	6/23/11	4:05 PM	2.0	27'-29'	85	255	50	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:05 PM	6/23/11	4:15 PM	2.0	29'-31'	85	340	40	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:15 PM	6/23/11	4:25 PM	2.0	31'-33'	85	425	40	8.0	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/23/11	4:25 PM	6/23/11	4:35 PM	2.0	33'-35'	85	510	40	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:35 PM	6/23/11	4:45 PM	2.0	35'-37'	85	595	45	8.0	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/23/11	4:45 PM	6/23/11	4:55 PM	2.0	37'-39'	85	680	45	8.0	0.289	28.9	58.7	84.7	85	
	6/23/11	4:55 PM	6/23/11	5:05 PM	2.0	39'-41'	85	765	45	8.0	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/23/11	5:05 PM	6/23/11	5:15 PM	2.0	40'-42'	85	850	45	8.0	0.289	28.9	58.7	84.7	85	1 ft. push to inject in the foot above the clay layer.
	6/24/11	7:20 AM	6/24/11	7:38 AM	2.0	42'-44'	85	935	38	6.0	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/24/11	7:38 AM	6/24/11	5:52 AM	2.0	44'-46'	85	1,020	40	6.0	0.289	28.9		84.7	85	
	6/24/11	7:52 AM	6/24/11	8:02 AM	2.0	46'-48'	85	1,105	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/24/11	8:02 AM	6/24/11	8:12 AM	2.0	48'-50'	85	1,190	45	6.0	0.289	28.9		84.7	85	
	6/24/11	8:12 AM	6/24/11	8:22 AM	2.0	50'-52'	85	1,275	52	8.5	0.289	28.9		84.7	85	
	6/24/11	8:22 AM	6/24/11	8:32 AM	2.0	52'-54'	85	1,360	50	8.5	0.289	28.9		84.7	85	
	6/24/11	8:32 AM	6/24/11	8:42 AM	2.0	54'-56'	85	1,445	50	8.5	0.289	28.9		84.7	85	
	6/24/11	8:42 AM	6/24/11	8:52 AM	2.0	56'-58'	85	1,530	50	8.5	0.289	28.9		84.7	85	
Total Volume 1700	6/24/11	8:52 AM	6/24/11	9:02 AM	2.0	58'-60'	85	1,615	45	8.5	0.289	28.9		84.7	85	
	6/24/11	9:02 AM	6/24/11	9:20 AM	2.0	60'-62'	85	1,700	40	8.5	0.289	28.9		84.7	85	Successfully completed location. Chased with 10 gal. Flush water.

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0017	6/27/11	10:10 AM	6/27/11	10:28 AM	2.0	23'-25'	85	85	15	4.0	0.289	28.9	58.7	84.7	85	
	6/27/11	10:28 AM	6/27/11	10:39 AM	2.0	25'-27'	85	170	40	7.7	0.289	28.9	58.7	84.7	85	
	6/27/11	10:39 AM	6/27/11	10:49 AM	2.0	27'-29'	85	255	40	8.5	0.289	28.9	58.7	84.7	85	
	6/27/11	10:49 AM	6/27/11	11:08 AM	2.0	29'-31'	85	340	40	8.5	0.289	28.9	58.7	84.7	85	Paused to change out an electrical cable.
	6/27/11	11:08 AM	6/27/11	11:20 AM	2.0	31'-33'	85	425	40	8.5	0.289	28.9	58.7	84.7	85	
Total nBA (gal) 5.8	6/27/11	11:20 AM	6/27/11	11:30 AM	2.0	33'-35'	85	510	40	8.5	0.289	28.9	58.7	84.7	85	
	6/27/11	11:30 AM	6/27/11	11:40 AM	2.0	35'-37'	85	595	40	8.5	0.289	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/27/11	11:40 AM	6/27/11	11:50 AM	2.0	37'-39'	85	680	40	8.5	0.289	28.9	58.7	84.7	85	
	6/27/11	11:50 AM	6/27/11	12:00 PM	2.0	39'-41'	85	765	40	8.5	0.289	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/27/11	12:00 PM	6/27/11	12:10 PM	2.0	40'-42'	85	850	40	8.5	0.289	28.9	58.7	84.7	85	Paused for lunch after this interval. 1 ft. push to inject in the foot above the clay layer.
	6/27/11	12:00 PM	6/27/11	1:05 PM	2.0	42'-44'	85	935	40	7.1	0.289	28.9		84.7	85	
Total H2O (gal) 1694.2	6/27/11	1:05 PM	6/27/11	1:18 PM	2.0	44'-46'	85	1,020	35	6.0	0.289	28.9		84.7	85	
	6/27/11	1:18 PM	6/27/11	1:30 PM	2.0	46'-48'	85	1,105	40	6.0	0.289	28.9		84.7	85	
Total Volume 1700	6/27/11	1:30 PM	6/27/11	1:43 PM	2.0	48'-50'	85	1,190	40	6.3	0.289	28.9		84.7	85	
	6/27/11	1:43 PM	6/27/11	1:53 PM	2.0	50'-52'	85	1,275	45	8.5	0.289	28.9		84.7	85	
	6/27/11	1:53 PM	6/27/11	2:03 PM	2.0	52'-54'	85	1,360	45	8.5	0.289	28.9		84.7	85	
	6/27/11	2:03 PM	6/27/11	2:13 PM	2.0	54'-56'	85	1,445	45	8.5	0.289	28.9		84.7	85	
	6/27/11	2:13 PM	6/27/11	2:23 PM	2.0	56'-58'	85	1,530	45	8.5	0.289	28.9		84.7	85	
IP-0018	6/28/11	8:55 AM	6/28/11	9:10 AM	2.0	23'-25'	85	85	25	6.0	0.280	28.9	58.7	84.7	85	
	6/28/11	9:10 AM	6/28/11	9:28 AM	2.0	25'-27'	85	170	30	7.0	0.280	28.9	58.7	84.7	85	
	6/28/11	9:28 AM	6/28/11	9:38 AM	2.0	27'-29'	85	255	32	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	9:38 AM	6/28/11	9:48 AM	2.0	29'-31'	85	340	35	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	9:48 AM	6/28/11	9:58 AM	2.0	31'-33'	85	425	40	8.5	0.280	28.9	58.7	84.7	85	
Total nBA (gal) 5.6	6/28/11	9:58 AM	6/28/11	10:10 AM	2.0	33'-35'	85	510	38	8.0	0.280	28.9	58.7	84.7	85	
	6/28/11	10:10 AM	6/28/11	10:22 AM	2.0	35'-37'	85	595	35	8.0	0.280	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/28/11	10:22 AM	6/28/11	10:34 AM	2.0	37'-39'	85	680	40	8.1	0.280	28.9	58.7	84.7	85	
	6/28/11	10:34 AM	6/28/11	10:45 AM	2.0	39'-41'	85	765	45	8.5	0.280	28.9	58.7	84.7	85	Took Lunch after this interval. 1 ft. push to inject in the foot above the clay layer.
Total KI (g) 586.5	6/28/11	10:45 AM	6/28/11	10:55 AM	2.0	40'-42'	85	850	45	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	11:30 AM	6/28/11	11:43 AM	2.0	42'-44'	85	935	40	6.0	0.280	28.9		84.7	85	
Total H2O (gal) 1694.4	6/28/11	11:43 AM	6/28/11	11:57 AM	2.0	44'-46'	85	1,020	40	6.0	0.280	28.9		84.7	85	
	6/28/11	11:57 AM	6/28/11	12:11 PM	2.0	46'-48'	85	1,105	40	6.0	0.280	28.9		84.7	85	
Total Volume 1700	6/28/11	12:11 PM	6/28/11	12:21 PM	2.0	48'-50'	85	1,190	45	8.5	0.280	28.9		84.7	85	
	6/28/11	12:21 PM	6/28/11	12:35 PM	2.0	50'-52'	85	1,275	40	6.0	0.280	28.9		84.7	85	Lowered the gpm to slow the rise in water on a well. (RW-8)
	6/28/11	12:35 PM	6/28/11	12:49 PM	2.0	52'-54'	85	1,360	40	6.3	0.280	28.9		84.7	85	
	6/28/11	12:49 PM	6/28/11	1:00 PM	2.0	54'-56'	85	1,445	43	6.5	0.280	28.9		84.7	85	
	6/28/11	1:00 PM	6/28/11	1:13 PM	2.0	56'-58'	85	1,530	40	6.0	0.280	28.9		84.7	85	
Total Volume 1700	6/28/11	1:13 PM	6/28/11	1:26 PM	2.0	58'-60'	85	1,615	35	6.0	0.280	28.9		84.7	85	
	6/28/11	1:26 PM	6/28/11	1:50 PM	2.0	60'-62'	85	1,700	40	6.3	0.280	28.9		84.7	85	Successfully completed location. Chased with 35 gal. chase water.

Hot Spot Area One, Launch Complex 34
Cape Canaveral Air Force Station

Vironex Field Data Sheet

Injection Point ID	Start Date	Start Time	End Date	End Time	Tool Length (ft)	Injection Interval	Gal per Interval	Running Total	Average PSI	Average Flow Rate	nBA Injected (gal)	KBr Injected (grams)	KI Injected (grams)	H2O Injected (gal)	Amended Total Gal	Notes
IP-0019	6/28/11	9:00 AM	6/28/11	9:15 AM	2.0	23'-25'	85	85	23	6.0	0.280	28.9	58.7	84.7	85	
	6/28/11	9:15 AM	6/28/11	9:29 AM	2.0	25'-27'	85	170	35	7.2	0.280	28.9	58.7	84.7	85	
	6/28/11	9:29 AM	6/28/11	9:40 AM	2.0	27'-29'	85	255	35	8.2	0.280	28.9	58.7	84.7	85	
	6/28/11	9:40 AM	6/28/11	9:50 AM	2.0	29'-31'	85	340	40	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	9:50 AM	6/28/11	10:03 AM	2.0	31'-33'	85	425	40	8.0	0.280	28.9	58.7	84.7	85	
Total nBA (gal) 5.6	6/28/11	10:03 AM	6/28/11	10:15 AM	2.0	33'-35'	85	510	38	8.0	0.280	28.9	58.7	84.7	85	
	6/28/11	10:15 AM	6/28/11	10:27 AM	2.0	35'-37'	85	595	40	8.0	0.280	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/28/11	10:27 AM	6/28/11	10:38 AM	2.0	37'-39'	85	680	30	7.8	0.280	28.9	58.7	84.7	85	
	6/28/11	10:38 AM	6/28/11	10:48 AM	2.0	39'-41'	85	765	40	8.5	0.280	28.9	58.7	84.7	85	
Total KI (g) 586.5	6/28/11	10:48 AM	6/28/11	10:58 AM	2.0	40'-42'	85	850	45	8.5	0.280	28.9	58.7	84.7	85	Took lunch after this interval. 1 ft. push to inject in the foot above the clay layer.
	6/28/11	11:32 AM	6/28/11	11:45 AM	2.0	42'-44'	85	935	43	6.0	0.280	28.9		84.7	85	
Total H2O (gal) 1694.4	6/28/11	11:45 AM	6/28/11	11:59 AM	2.0	44'-46'	85	1,020	40	6.0	0.280	28.9		84.7	85	
	6/28/11	11:59 AM	6/28/11	12:13 PM	2.0	46'-48'	85	1,105	38	6.0	0.280	28.9		84.7	85	
Total Volume 1700	6/28/11	12:13 PM	6/28/11	12:23 PM	2.0	48'-50'	85	1,190	45	8.5	0.280	28.9		84.7	85	
	6/28/11	12:23 PM	6/28/11	12:33 PM	2.0	50'-52'	85	1,275	45	8.5	0.280	28.9		84.7	85	
	6/28/11	12:33 PM	6/28/11	12:43 PM	2.0	52'-54'	85	1,360	45	8.5	0.280	28.9		84.7	85	
	6/28/11	12:43 PM	6/28/11	12:54 PM	2.0	54'-56'	85	1,445	45	8.5	0.280	28.9		84.7	85	
	6/28/11	12:54 PM	6/28/11	1:04 PM	2.0	56'-58'	85	1,530	45	8.5	0.280	28.9		84.7	85	
IP-0020	6/28/11	1:06 PM	6/28/11	1:17 PM	2.0	58'-60'	85	1,615	45	8.5	0.280	28.9		84.7	85	
	6/28/11	1:17 PM	6/28/11	1:27 PM	2.0	60'-62'	85	1,700	45	8.5	0.280	28.9		84.7	85	Successfully completed location. Chased with 35 gal. chase water.
	6/28/11	9:05 AM	6/28/11	9:25 AM	2.0	23'-25'	85	85	30	7.0	0.280	28.9	58.7	84.7	85	
	6/28/11	9:25 AM	6/28/11	9:35 AM	2.0	25'-27'	85	170	35	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	9:35 AM	6/28/11	9:45 AM	2.0	27'-29'	85	255	40	8.5	0.280	28.9	58.7	84.7	85	
Total nBA (gal) 5.6	6/28/11	9:45 AM	6/28/11	9:55 AM	2.0	29'-31'	85	340	45	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	9:55 AM	6/28/11	10:07 AM	2.0	31'-33'	85	425	45	8.2	0.280	28.9	58.7	84.7	85	
	6/28/11	10:07 AM	6/28/11	10:19 AM	2.0	33'-35'	85	510	43	8.0	0.280	28.9	58.7	84.7	85	
	6/28/11	10:19 AM	6/28/11	10:30 AM	2.0	35'-37'	85	595	45	8.3	0.280	28.9	58.7	84.7	85	
	6/28/11	10:30 AM	6/28/11	10:40 AM	2.0	37'-39'	85	680	45	8.5	0.280	28.9	58.7	84.7	85	
Total KBr (g) 578.0	6/28/11	10:40 AM	6/28/11	10:50 AM	2.0	39'-41'	85	765	45	8.5	0.280	28.9	58.7	84.7	85	
	6/28/11	10:50 AM	6/28/11	11:00 AM	2.0	40'-42'	85	850	45	8.5	0.280	28.9	58.7	84.7	85	Took lunch after this interval. 1 ft. push to inject in the foot above the clay layer.
Total KI (g) 586.5	6/28/11	11:34 AM	6/28/11	11:47 AM	2.0	42'-44'	85	935	38	6.0	0.280	28.9		84.7	85	
	6/28/11	11:47 AM	6/28/11	12:00 PM	2.0	44'-46'	85	1,020	40	6.0	0.280	28.9		84.7	85	
Total H2O (gal) 1694.4	6/28/11	12:00 PM	6/28/11	12:14 PM	2.0	46'-48'	85	1,105	40	6.0	0.280	28.9		84.7	85	
	6/28/11	12:14 PM	6/28/11	12:24 PM	2.0	48'-50'	85	1,190	45	8.0	0.280	28.9		84.7	85	
	6/28/11	12:24 PM	6/28/11	12:34 PM	2.0	50'-52'	85	1,275	45	8.0	0.280	28.9		84.7	85	
	6/28/11	12:34 PM	6/28/11	12:44 PM	2.0	52'-54'	85	1,360	45	8.0	0.280	28.9		84.7	85	
	6/28/11	12:44 PM	6/28/11	12:54 PM	2.0	54'-56'	85	1,445	45	8.0	0.280	28.9		84.7	85	
Total Volume 1700	6/28/11	12:54 PM	6/28/11	1:04 PM	2.0	56'-58'	85	1,530	45	8.5	0.280	28.9		84.7	85	
	6/28/11	1:04 PM	6/28/11	1:14 PM	2.0	58'-60'	85	1,615	45	8.5	0.280	28.9		84.7	85	
	6/28/11	1:14 PM	6/28/201	1:30 PM	2.0	60'-62'	85	1,700	45	7.7	0.280	28.9		84.7	85	Successfully completed location. Chased with 35 gal. chase water.
									Avg	Avg	nBA	KBr	KI	H2O	Total Gal	Points Completed
									39.7	7.3	115.0	11,560.0	11,730.0	33,885.0	34,000.0	20.0

ATTACHMENT C-2

FIELD FORMS

Project: ALCJY ESTCP PED Date: 1/17/2011
 Project No.: TR0232 Task No.: _____
 Contractors: EDS - Mike Miller, Cory Lovel, Carl Lischke

Work Performed

Well Installation: <u>X - HSA</u>	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern

0715 - arrive @ bonding station - prep paperwork
 0845 - onsite - bonding office closed - extra hr for bonding
 0850 - called duty office to verify on the dig
 - tailgate mtg
 - FECC onsite - dirt in bottom of roll off
 1120 - tornado warning - packed up site & left
 for lunch - covered roll off & removed back
 1245 - back onsite - call weather - another tornado warning
 to be posted & should be in phase 2 - remainder
 of day
 1300 - left site

Plans/Future Activities

- only partially installed PW0022 - got through sand seal will
 complete tomorrow

M. Miller 1/17/11
 Signature/Date

Project: ESTCP - PED Date: 1/11/2011
 Project No.: TR0272 Task No.: _____
 Contractors: EDS - Mike Miller, Cory Cove, Carl Leubert

Work Performed

Well Installation: X- HSA Sampling Soil: _____
 Soil Borings: _____ Sampling SW/Sediment: _____
 DPT: _____ Sampling Monitor Wells: _____
 Well Inventory: _____ Sampling Hazardous Waste: _____
 Other: _____ Sampling Drums: _____

Observations/Issues of Concern

0700 - @ budgeting station - meet dollars
 0720 - on site - call duty officer - OK to dig
 0725 - tail gate receiving
 - completed install of PW0021 & PW0022
 - begin split spoon sample @ RW location b/c cannot have
 DPT rig & HSA rig in same area due to space
 concerns
 1030 - Emily Watley w/ St Johns River WMD arrive to
 GPS well locations - we were split spoon sampling
 location for RW0008 → informed we well permit
 not issued yet ⇒ cannot install well - left augers
 in pond @ ~ 20ft DLS & moved to injection well
 location
 1100 - left site for lunch → Bob & I went to pool for spill
 pallet
 1215 - back onsite

Plans/Future Activities

1100 - left site
 - installed injection well PJ0017, PJ0018, PJ0019, PJ0020

M. G. Miller 1/11/2011
 Signature/Date

Project: <u>LCJ4</u>	Date: <u>1/17/2011</u>
Project No.: <u>TR0272</u>	Task No.: _____
Contractors: <u>EDJ - Mike Miller, Cory Cole, Carl Leonhardt, Chris Philip, Nathaniel MS Labu - Steve Paulson</u>	

Work Performed	
Well Installation: <u>X</u>	Sampling Soil: _____
Soil Borings: <u>X</u>	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0725 - onsite - EDJ onsite
0750 - called daily office ok to dig → bulgate
0815 - carburetor PIDs - 590-000317 MiniRAE Life
0 ppm → 0 ppm
100 ppm → 100.2 ppm
- 590-000309 MiniRAE Life
0 ppm → 0 ppm
100 ppm → 100.0 ppm
1030 - angle rig down - sheared part - Joe & Mike off site to find parts
1200 - Joe & Mike back onsite
~ 1000 - Emily from SJ RWTD onsite w/ permit for recovery well
1200 - Neil & Joe offsite for lunch & to get spill pallet

Plans/Future Activities
* SD0002 & SD0003 → grain size & TOC from 27-29 ft BLS collected @ 1629
* SD0002 & SD0003 → grain size & TOC & 7 metals from 33-35 ft BLS collected @ 1646 (grain size from SD0002 only)
* SD0003 - 044,0 @ 1220 - DHC sample " from MS

[Signature] 1/20/11
Signature/Date

Project: <u>LC24</u>	Date: <u>1/17/11</u>
Project No.: <u>TR0272</u>	Task No.: _____
Contractors: <u>Sant w py 1</u>	_____

Work Performed	
Well Installation: <u>X</u>	Sampling Soil: _____
Soil Borings: <u>X</u>	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern	
- Sample SD1001-044.5 - 20110119 @ 1656 - DHC	
- SD 1003 & SD1002 - grain size (SD1002), TOC & % solids from 47 to 48 @ 1657	
- "SD1003 & SD1002 - grain size (SD1002), TOC & % solids" from 52 to 54 @ 1720	
- SD1002 - 042.5 - DHC @ 1657	
- SD 1003 - 046.0 - DHC @ 1700	
- SD 1002 - 046.0 - DHC @ 1700	
- SD 1002 - 042.5 - DHC @ 1657	
- left site @ 1745 - back to office	
- filled out COCs & organized samples - left off 1915	

Plans/Future Activities	
- completed 3 DPT soil borings @ locations for DW0001, DW0002, DW0003	
- split spaw not completed b/c auger rig broke down	
- installed RW0008	


[Signature] 1/17/11
Signature/Date

Project:	EJTCP PED 4034	Date:	1/20/11
Project No.:	110272	Task No.:	
Contractors:	EDS - Mike Miller, Cory Ross, Carl Leuchter, Chris Miller, Kevin Olson		

Work Performed	
Well Installation:	X DPT & HSA
Soil Borings:	
DPT:	
Well Inventory:	
Other:	
Sampling Soil:	
Sampling SW/Sediment:	
Sampling Monitor Wells:	
Sampling Hazardous Waste:	
Sampling Drums:	

Observations/Issues of Concern	
0720 - on site	
0730 - bridge	
0755 - called duty officer ok to dig	
Calhoun PPD	SN# 520-000-309
	SN# 520-000-317 (Mike Miller)
0 ppm	0 ppm
100 ppm	99.9 ppm
0 ppm	0 ppm
100 ppm	100.0
- EDS didn't have 1ft PVC riser => we changed construction of 51-61 & 51-54 ft wells	
* 51-61 ft well have 10ft riser pipe above screen & three two barbed wire sleeves	
* 51-54 well have 2.5 ft riser pipe & two barbed wire sleeves -> 2.5 ft riser pipe delivered on Monday	
- Monitoring air around DPT during well install - finding PPD continuously	

Plans/Future Activities		
Calculate turbidity meter - Lantette 2020		
	initial	final
1.0	1.04	1.02
10.0	10.28	10.05


Signature/Date

Project: <u>EDGEFIELD LEJUN</u>	Date: <u>1/20</u>
Project No.: <u>110272</u>	Task No.: _____
Contractors: <u>same as page 1</u>	_____

Work Performed	
Well Installation: <u>X Well development</u>	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern

- Developed injection well IT0020 - using submersible pump
 ~ 1-2 gpm started @ 1216 stopped @ 1243 ~ 25 gallons - turbid
- Developed injection well IT0019 - started @ 1244 stopped 1259
 ~ ~~15~~ 18-20 gallons removed - turbid
- 1430 Mike Duff on site
- Developed injection well IT0017 - started @ 1525
 stopped @ 1559 - had to raise
 started @ 1550 ; stopped @ 1556
 - cleared quickly ; ~ 25 gal
 + power from battery
- Developed injection well IT0017 - started @ 1600 stopped @ 1616
 ~ 12 gallons

Plans/Future Activities

- Developed injection well IT0022 started @ 1621 stopped @ 1641
 ~ 20 gal
- Developed injection well IT0021 started @ _____

M. G. [Signature] 1/20
Signature/Date

Project: <u>RIVER PED LOG</u>	Date: <u>1/20</u>
Project No.: <u>110272</u>	Task No.: _____
Contractors: <u>Sant and by 4</u>	

Work Performed	
Well Installation: <u>X 1 well development</u>	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
<p><u>Developed RW0008 - should to - removed 18 gal -> will complete tomorrow</u></p> <p><u>left site 1715</u></p>

Plans/Future Activities
<p><u>need to develop IJ0019 & IJ0020 now</u></p>

M Sant and by 4
Signature/Date

Project: ESTCP PED 404 Date: 1/21
 Project No.: TR0272 Task No.: _____
 Contractors: EOS - Mike Mullis, Cory Cole, Carl Kroschardt, Chris Phelps, Keith Owen

Work Performed

Well Installation: X 1 well development Sampling Soil: _____
 Soil Borings: _____ Sampling SW/Sediment: _____
 DPT: _____ Sampling Monitor Wells: _____
 Well Inventory: _____ Sampling Hazardous Waste: _____
 Other: _____ Sampling Drums: _____

Observations/Issues of Concern

0720 - ONSITE EDS ONSITE
 0725 - CALLED DWTY OFFICE ON TO DED
 POURING RAIN - DEVELOPED WELLS & STARTED INSTALLING
 VAULT DOORS W/IT PL PASSED
 - DEVELOPED INT0021 - SUMMERVILLE PUMP ~ 20min ~ 20 gal
 - DEVELOPED INT0019 & INT0020 FURTHER - ~ 10 gal
 from INT0020 & ~ 7 gal from INT0019
 - left site for lunch 1200 return 1300
 - DEVELOPED INT0014 started @ 1316 stopped @ 1341
 ~ 20 gal removed
 DEVELOPED INT0013 started @ 1343 stopped @ 1357
 DEVELOPED INT0016 started @ 1405 stopped @ 1432
 removed ~ 20 gal
 DEVELOPED INT0015 started @ 1438 stopped @ 1510
 removed ~ 20 gal

Plans/Future Activities

- completed vault box install & pad on INT0013 & INT0014
- completed development of all INJECTION WELLS
- completed development of deep recovery well


Mike Mullis 1/21
 Signature/Date

Project: <u>ESTCP LC34</u>	Date: <u>1/24/11</u>
Project No.: <u>TR0072</u>	Task No.: <u>04</u>
Contractors: <u>EDS (Mike, Cory, Carl, Keith, Chris)</u>	

Work Performed	
Well Installation: <u>BW0001 E, BW0002 E, BW0003 BC + E</u>	Sampling Soil: <u>Roll off</u>
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>Develop RW0007 + Bundle wells.</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0615 Arrive @ Titusville office. Calibrate YSI's of food vehicles
0730 Arrive on site. Both drill crews onsite.
0745 Tailgate safety meeting. Call Polk office + confirm dig permit #
0800 Drillers develop BW0001 cluster while installing BW0003 BC + E wells. Hollow stem drillers begin pad forming at IS IS injection wells + set up to develop RW0007
0845 Take composite sample from roll off.
0930 Development of RW0007 finished. ~85 gal removed
1130 DPT drillers take lunch. BW0003 BC + E + BW0002 E installed.
1150 Take lunch. Retrieve "Empty" labels for empty contaminated drums from Headquarters. All IS wells packed. Drillers working on BW0008 + 0007 pads
1250 Return to site. Hollow stem drill rig + drillers have left the site. DPT drillers waiting for bentonite seal to hydrotest final well. Begin sounding all wells for total depth. Development continues.
1330 All wells installed. Drillers clean site + excavate pad areas

Plans/Future Activities
4x6 pads to be placed over each bundle wellset.
1545 Drillers leave site to load truck w/ concrete to make pads. development continues.
1615 Drum log updated leave site for Titusville office.
1645 CCV of YSI's. Package WS0001 sample for FedEx shipping
1705 AW0001 WS0001 samples sent to CAS. End of field day

 1/24/11
Signature/Date

Project: <u>ESTCP LC34</u>	Date: <u>1/25/11</u>
Project No.: <u>TR 0272</u>	Task No.: <u>04</u>
Contractors: <u>EDS (Chris Phelps + Keith Olson)</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>Pad installation</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
<u>0615 Arrive @ Titusville office. Calibrate VSI + pack vehicle.</u>
<u>0730 Arrive @ LC34 site. Drillers onsite. Begin padding BLV0001</u>
<u>0800 Tailgate safety meeting. Development of wells continues.</u>
<u>1045 All 4x6 pads in place. Pads covered w/ plastic to protect the wet concrete from too fast rain.</u>
<u>1100 All wells developed. Final updates made to drum log. Final site clean up. All spill pallets covered + strapped. All garbage removed + disposed in dumpster.</u>
<u>1125 Drillers leave site. End of field efforts</u>

Plans/Future Activities

Chris Phelps 1/25/11
Signature/Date

BORING NO.: SD1001 PROJECT NO.: TR0272 PAGE 1 OF 3
 E: LC04 DATE: 1/19/2011
 TOOLS AND METHOD: SPLIT SPIN BIT DIA: _____
 TOTAL DEPTH: 47 FT GROUNDWATER DEPTH: ~7 FT
 DRILLING COMPANY: EDS RIG: HSA w/ 2.5 inch bit.
 DRILLERS: MIKE MILLER, Corey Cowl LOGGERS: R. DARRADO

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE (ft)	PID (ppm)	DRILLING LOG
HAND AUGERED 0-5 FT DLS		0 1 2 3 4 5		NO RPP from 5-19 FT DLS
TAN MEDIUM SAND w/ SHELL (<20%)		6 7 8 9 10 11		
TAN MED SAND w/ SHELL (>50%)		12		
NO REC RECOVERY 11-12 FT DLS		13		
GRAY & TAN FINE TO MED SAND w/ SHELLS (<10%)		14 15		
NO RECOVERY 15-16 FT DLS		16		
GRAY FINE SAND w/ SHELL (<10%)		17 18 19		

LITHOLOGY LOG	DEPTH (ft) GRAPHIC LOG	DEPTH SCALE LOG	PID (ppm)	DRILLING LOG
TAN & GRAY FINE SAND w/ SHELL (<15%)	20	20	21.5	
	21			
	22		80.0	
	23			
	24		294	Sample @ 24ft 0905
NO RECOVERY 25-26 FT BLS	25			
	26			
GRAY FINE SAND	22	102.4		PID Remains
GRAY SILTY FINE SAND	28	70.1		
	29			
GRAY FINE SAND w/ SHELL (<10%)	30	132.2		
	31			
	32	202.4		
	33			
	34			
SILTY FINE SAND	35	728		Sample @ 35.5ft 0930
	36			
GRAY SILTY FINE SAND w/ SHELL < 10%	37	124.7		
NO RECOVERY 37-38 FT BLS	38			
	39			
	40	200		
GRAY FINE SAND w/ SHELL (>50%)	41	377.2		Sample @ 41ft @ 0948
	42			
	43	384		
	44	344.1		Sample @ 44.5ft @ 1009
Clayey silty sand				

LITHOLOGY LOG

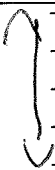
DEPTH (ft)
GRAPHIC
LOG

DEPTH
SCALE

PID
(ppm)

DRILLING LOG

Clayey silty sand



45

120.7

46

47

52.2

48

49

50

51

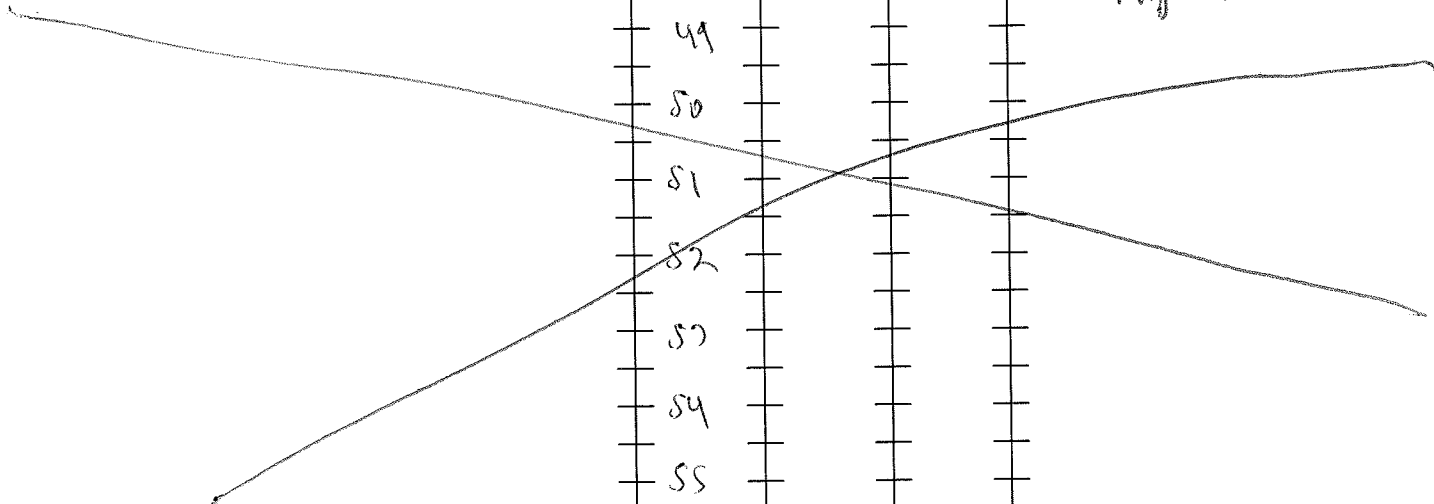
52

53

54

55

- Boring not complete
Rig down



Same borehole B102

BORING NO.: S131002 PROJECT NO.: TRO272 PAGE 1 OF 2

E: LC34

DATE: 1/19/11

TOOLS AND METHOD: DPT

BIT DIA: 3" 2 1/4"

TOTAL DEPTH: 60 ft

GROUNDWATER DEPTH: ~7 ft

DRILLING COMPANY: EDS

RIG: Geoprobe G620DT

DRILLERS: Chris + Keith

LOGGERS: Neil Stokely

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
Hand Auger to 5'		(ft)		
Fine M Sand w/ 5% shell		5	0.0 0.5 0.2	
Medium Gray w/ 15% shell		10	0.1 0.3 0.1	
Gray F-M Sand w/ 5% shell		15	0.8 4.6 1.6 0.9	
Gray F-M Sand w/ 5% shell		20	8.1 11.1 17.5 19.3	
Gray F Sand fine shell		25	29.4 10.2 25.2	
Gray F-M Sand w/ 5% shell		30	6.6 49.7 32.8 24.5	
Dark Gray shell wash w/ 20% silt		35	6.7 28.5 4.5 10.2	
		40		

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE (ft)	PID (ppm)	DRILLING LOG
gray shell hash of silt silty sand clay, no shell		40	2.0 1.1 0.2	
Gray clayey silty F sand		45	1.7 2.1 0.8 0.1	
Gray F-M sand		50	0.1 0.0 0.1	
Gray Gray silty fine sand		55	0.1 0.1 0.1	
gray silty fine sand		60	0.3 0.4 0.1 0.2 0.3	

Site As BWO01

BORING NO.: SB002 PROJECT NO.: TR0272 PAGE 1 OF 2

≡: LC34 DATE: 1/19/11

TOOLS AND METHOD: DPT BIT DIA: 2 1/4"

TOTAL DEPTH: 60 ft GROUNDWATER DEPTH: ~ 7 ft

DRILLING COMPANY: EDS RIG: Geoprobe 2260DT

DRILLERS: Chris + Keith LOGGERS: No. 15 Staple

LITHOLOGY LOG

GRAPHIC LOG

DEPTH SCALE (ft)

PID (ppm)

DRILLING LOG

Need Auger to 5' to avoid utilities

tan M SAND w/ 15% silt

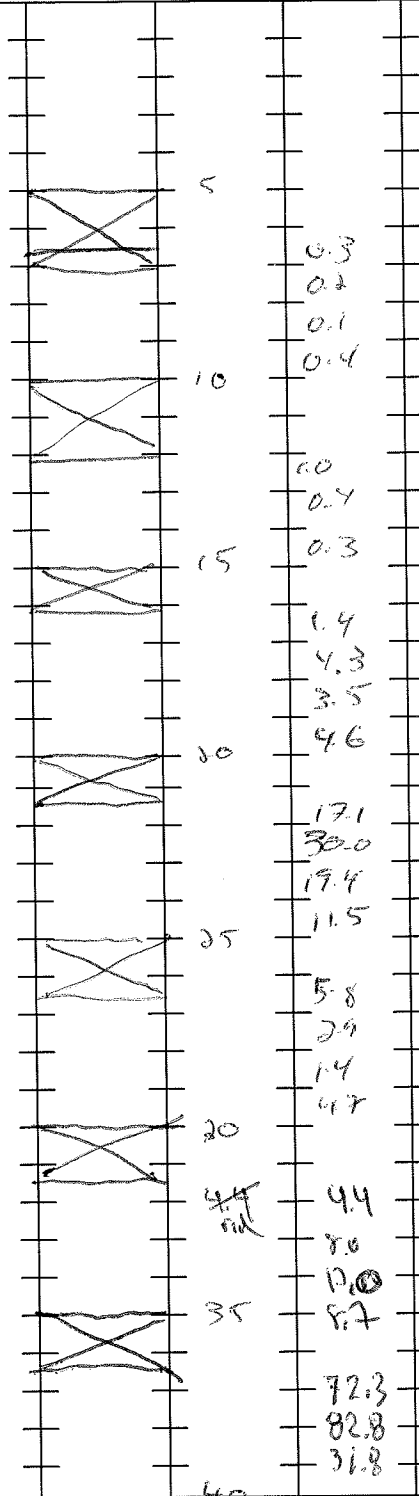
Grey M-F SAND w/ 10% shell

M-F Grey SAND w/ 10% silt

As above w/ trace silt

SILTY FINE GRAY SAND

gray fine F silty sand



LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE (ft)	PID (ppm)	DRILLING LOG
gray silty sand		40	50.8 93.6 169.0 356.2 35.4	-sampled 1370 44 ft
gray clayey silt F sand		45	37.5 14.2	-sampled @ 1320 43 ft
gray F-M sand		50	6.0 6.3	43 ft
gray silty fine sand w/ shells		50	3.1 0.5	-sampled 46 ft @ 1354
gray F-M silty sand		55	0.4 0.2	-sampled 49.5 ft @ 1352
gray coarse sand w/ shell hash		60	0.5 0.5	

BORING NO.: SB1004 / same as BW003 PROJECT NO.: TROTT PAGE 1 OF 2
 E: LC 34 DATE: 1/19/11
 TOOLS AND METHOD: DPT BIT DIA: 2 1/4"
 TOTAL DEPTH: 60 ft GROUNDWATER DEPTH: 47 ft
 DRILLING COMPANY: EAS RIG: DPT
 DRILLERS: C. PITSLIPS ; V. OLSON LOGGERS: N. STAPLEY

LITHOLOGY LOG

GRAPHIC LOG

DEPTH SCALE (ft)

PID (ppm)

DRILLING LOG

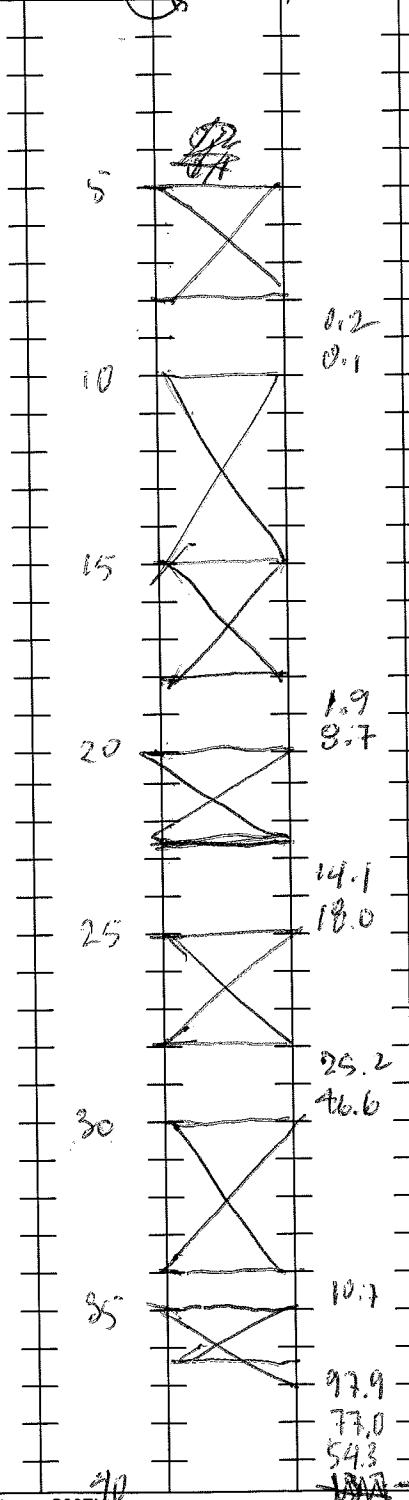
Tan Medium Sand

Tan ^{gray} med. sand

gray medium sand w/ shell

gray F-M sand

gray F-M ^{silty} sand w/ shell



0.2
0.1

1.9
8.7

14.1
18.0

25.2
46.6

10.7

97.9
77.0
54.3
~~100.0~~

sampled 34.5 ft @ 1514

sampled 37 ft @ 1530

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE (ft)	PID (ppm)	DRILLING LOG
gray F-M sand w/ shell		40	33.0	sampled 43 ft 43 ft
gray silty clay		45	38.9	1543
gray silty clay		50	64.6	sampled 46.5 ft @ 1555
gray coarse silty sand w/ shell		50	31.7	sampled 45 ft @ 1553
Gray F Sand Silty w/ shell		55	19.8	sampled 50 ft @ 1556
Gray silty shelly SAND. V. wet.		55	10.5	
		60	1.5	
			1.0	
			0.2	
			0.1	
			0.3	
			0.2	
			0.2	
			0.2	
			0.2	
			0.2	
			0.2	
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			0.2	

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TR027Z Field Personnel: JVB

Water Quality Meter - Model/Serial #: YSI 350 MPS 08A100738 Turbidimeter - Model/Serial #: 08A100738 LAMOTTE ME12153

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		1/24/11	0625	22.12	8.744	8.29/8.22	100.2/100.0	P F
CAL ICV CCV		1/24/11	1700	23.68	8.482	8.31		P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	1/24/11	9.85/9.92	P F
CAL ICV CCV		10.48	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/24/11	0640	1.913	7807	3/11	1.297/1.413	P F
CAL ICV CCV		1/24/11	1710	1.913	7807	3/11	1.450	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		1/24/11	0635	4.0	3002536	3/12	4.09/4.00	P F
CAL ICV CCV				7.0	2002012	1/12	7.19/7.00	P F
CAL ICV CCV				10.0	7796	3/11	10.00/10.00	P F
CAL ICV CCV		1/24/11	1700	4.0	3002536	3/12	4.06	P F
CAL ICV CCV				7.0	2002012	1/12	7.17	P F
CAL ICV CCV				10.0	7796	3/11	10.02	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/24/11	0645	240.825	2244	3/15	238.0/240.0	P F
CAL ICV CCV		1/24/11	1705	240.825	2244	3/15	238.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

- 1. See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TR0872 Field Personnel: NRS

Water Quality Meter - Model/Serial #: YSI 556MPS / 05D7373 AK Turbidimeter - Model/Serial #: Lotte 2000 / 2022-1602

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		1/24/11	0635	22.0	8.744	8.20/8.75	93.9/100.0	(P) F
CAL ICV CCV		1/24/11	1650	22.5	8.627	8.77	101.6	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/24/11	0640	1.413	7807	3-11	1.095/1.413	(P) F
CAL ICV CCV		1/24/11	1650	1.413	7807	3/11	1.412	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		1/24/11	0635	4.0	2003520	3-12	3.94/4.00	(P) F
CAL ICV CCV				7.0	2003012	1-12	7.23/7.00	(P) F
CAL ICV CCV				10.0	7796	3-12	9.94/9.99	(P) F
CAL ICV CCV			1655	4.0	2003520	3/12	4.1	(P) F
CAL ICV CCV				7.0	2003012	1/12	6.92	(P) F
CAL ICV CCV				10.0	7796	3/14	9.80	(P) F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/24/11	0645	240 @ 25	2244	3-15	237.8/250.1	(P) F
CAL ICV CCV		1/24/11	1705	240 @ 25	2244	3/15	239.1	(P) F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		1/24/11	9.33/10.07	(P) F
CAL ICV CCV			10.37	(P) F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272

Field Personnel: JVB

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 4K

Turbidimeter - Model/Serial # LA-M-2-2000 / ME12153

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>630</u>	<u>22.64</u>	<u>8.644</u>	<u>8.53/8.50</u>	<u>98.0/97.9</u>	<u>P</u> F
CAL ICV CCV		<u>1/25/11</u>	<u>1340</u>	<u>24.02</u>	<u>8.418</u>	<u>8.13</u>	<u>96.4</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>635</u>	<u>1.413</u>	<u>7807</u>	<u>3/4</u>	<u>1.47/1.413</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>1355</u>	<u>1.913</u>	<u>7807</u>	<u>3/11</u>	<u>1.377</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>635</u>	<u>4.0</u>	<u>3002576</u>	<u>3/12</u>	<u>4.09/4.00</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>1450</u>	<u>7.0</u>	<u>200292</u>	<u>4/2</u>	<u>6.93/7.00</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>10.0</u>	<u>796</u>	<u>3/11</u>	<u>9.81/9.97</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>1350</u>	<u>9.0</u>	<u>same as above</u>	<u>same as above</u>	<u>4.14</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>7.0</u>	<u>above</u>	<u>above</u>	<u>7.09</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>10.0</u>			<u>9.88</u>	<u>P</u> F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>1/25/11</u>	<u>650</u>	<u>240 @ 25°</u>	<u>2244</u>	<u>3/15</u>	<u>235.2/240.0</u>	<u>P</u> F
CAL ICV CCV		<u>1/25/11</u>	<u>1400</u>	<u>240 @ 25°</u>	<u>2244</u>	<u>3/15</u>	<u>236.7</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10</u>	<u>1/25/11</u>	<u>9.43/10.00</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10</u>	<u>1/25/11</u>	<u>10.76</u>	<u>P</u> F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

- 1. See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC 34

Project #: TK0272

Field Personnel: JVB

Water Quality Meter - Model/Serial #: YSI 556 MPS / 08A100738

Turbidimeter - Model/Serial # LaMotte 2020 / 2622-1602

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		1/25/11	630	23.18	8.546	877/872	102.4/101.4	P F
CAL ICV CCV		1/25/11	1322	25.07	8.263	832	100.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/25/11	635	1.413	7807	3/11	1.452/1.413	P F
CAL ICV CCV		1/25/11	1340	1.413	7807	3/11	1.451	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		1/25/11	635	4.0	3002536	3/12	4.03/4.00	P F
CAL ICV CCV				7.0	2802012	3/12	7.14/7.00	P F
CAL ICV CCV				10.0	7796	3/11	9.71/10.00	P F
CAL ICV CCV		1/25/11	1330	same as above	same as above	same as above	4.25	P F
CAL ICV CCV				above	above	above	7.25	P F
CAL ICV CCV							9.88	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/25/11	650	240 @ 25°	2244	3/15	256.5/240.0	P F
CAL ICV CCV		1/25/11	1345	240 @ 25°	2244	3/15	237.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	1/25/11	10.14/10.11	P F
CAL ICV CCV	1/25/11	7.6	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



WELL DEVELOPMENT DATA FORM

Site Name: <u>LC34</u> Well Name: <u>BL0001 E</u> Depth To Bottom: Measured (Initial) <u>59^{ft} 53.32'</u> from Top (Final) <u>54</u> Field Cleaning of Equip: <u>N/A</u> Save Purge Water: <u>Yes</u> Measuring Point: <u>TEL</u> Casing I.D.: <u>3/4"</u>	Project Number: <u>TR0272</u> Date Installed: <u>1/24/11</u> Date Developed: <u>1/25/11</u> Pump (Type) <u>PARASTATIC</u> (Capacity) <u>0.15 gpm</u> pumping rate Purge Water Containment Method: <u>stored in drums</u> GeoSyntec Representative: <u>JLB</u> Drilling Firm Representative: <u>EOS</u>
--	--

Time	Volume Removed (gal)	pH	Temp (°C)	Conductance (µS/cm)	Turbidity (NTU)	Salinity (ppm)	ORP (mV)	Comments
0925	0	7.97	22.67	2123	err 4	1.17	-82.5	gray
0930	0.75	7.83	23.49	2504	err 4	1.33	-239.0	gray
0937	2.0	7.80	23.76	2522	1155	1.33	-230.6	cloudy-gray
0945	3.25	7.76	23.83	2550	27.8	1.35	-209.3	clear-gray
0950	4.25	7.75	23.94	2555	156	1.35	-205.5	clear-gray
0955	5.0	7.74	23.98	2558	41.5	1.35	-199.3	clear

*Err 4 indicates error in reading

WELL DEVELOPMENT DATA FORM

Site Name: <u>U39</u>	Project Number: <u>TRO272</u>
Well Name: <u>BW0002 E</u>	Date Installed: <u>1/25/11 1/24/11</u>
Depth To Bottom: (Measured Initial) <u>54</u> ^{JWB} 53.36'	Date Developed: <u>1/24/11</u>
(from TOC) (Final) <u>54</u>	Pump (Type) <u>PERISTALTIC</u>
	(Capacity) <u>0.15 gpm</u>
	pump ^{rate} <u>J</u>
Field Cleaning of Equip: <u>N/A</u>	Purge Water Containment Method: <u>stored in drums</u>
Save Purge Water: <u>Yes</u>	GeoSyntec Representative: <u>JWB</u>
Measuring Point: <u>TOC</u>	Drilling Firm Representative: <u>EWS</u>
Casing I.D.: <u>3/4"</u>	

Time	Volume Removed (gal)	pH	Temp (°C)	Conductance (μS/cm)	Turbidity (NTU)	Salinity (ppm)	ORP (mV)	Comments
1019	0	8.02	24.50	2690	Err 4	1.41	-204.1	grey
1025	2.0	7.91	24.50	2709	367	1.41	-183.7	cloudy-grey
1031	3.25	7.89	24.49	2712	109.6	1.42	+72.7	clear-grey
1037	4.5	7.88	24.48	2711	75.6	1.42	-167.3	clear-grey

*Err4 indicates error in reading

Total Depth of Completed Wells

Project/Project Number: _____

Date: _____

Time	DPT Location	Screened Interval (ft BLS)	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTUs)	DO (mg/L)	Temp (°C)	Salinity (%)	TDS (g/L)	ORP (mV)	Color / Notes
	BW0001 A	25.46	10.28	25.74							
	B	32.41	↓	32.69							
	C	39.48		39.76							
	D	46.29		46.48	46.57						
	E	53.04		53.32							
	F	60.11		60.39							
	BW0002 A	25.44		25.72							
	B	32.40		32.68							
	C	39.50		39.78							
	D	46.16		46.44							
	E	53.08		53.36							
	F	60.09		60.37							
	BW0003 A	25.49		25.77							
	B	32.30		32.58							
	C	38.41		38.69							
	D	46.20		46.48							
	E	53.04		53.32							
	F	59.92		60.20							

Add 0.28' to compensate for water level meter probe length

Notes:
 DPT = Direct Push Technology
 ft BLS = feet below land surface
 mS/cm = milliSiemens per centimeter (or millimhos per centimeter)
 NTU = Nephelometric Turbidity Units
 P:\Administrative\Field Forms\DPT Groundwater Form

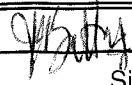
DO (mg/L) = Dissolved Oxygen (milligrams per liter)
 Temp (°C) = Temperature (degrees Celsius)
 TDS (g/L) = Total Dissolved Solids (grams per liter)
 ORP (mV) = Oxidation Reduction Potential (milliVolts)

Project: <u>10027 LC39</u>	Date: <u>2/1/11</u>
Project No.: <u>100272</u>	Task No.: _____
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>BW0001AF, BW0002AF</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0700 - office, calibrate VSI by turbidimeter.
0800 - on site, safety meeting.
0850 - begin sampling
- completed BW0002 D-F, BW0001 A-C
1130 - lunch
- dropped off JOE's NASA badging paperwork.
- bought 9V batteries
1230 - on-site
1600 - left site to ship samples
- completed BW0001 B-F, BW0002 A-C
BW0003 E, F, A, B
1700 - cal VSI and turbidimeter
1730 - end of day

Plans/Future Activities

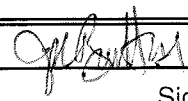
 2/1/11
 Signature/Date

Project: <u>LC34</u>	Date: <u>2/2</u>
Project No.: <u>PR0272</u>	Task No.: _____
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>BW, IW, IS</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0700 - office, calibrate, ILV
0800-1000 - GSA pump change out
1000 - onsite
+ completed sampling = 1W00690, 1W00710, 1W00710I
+ GPS for IW and BW
1200 - Lunch
1230 - onsite
Complete sampling: BW0007C4D, RW000748, 1W0076, 1W0020
1W00670, 1W00700, 1W00700I, 1W00209,
1W00710, 1W00710I
1415 - 1615 - left site to ship samples

Plans/Future Activities
1930 - office - end of day

 2/2/11
 Signature/Date

Project: <u>#R0272 CC39</u>	Date: <u>2/3/11</u>
Project No.: <u>TR0272</u>	Task No.: _____
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0650 - at office, calibrate, load truck.
0800 - on site
completed sampling on: 150019, 150015, 150016, 150021
150025 was found destroyed
- soil @ 5.5 ft. B.S.
1200 - lunch
1230 - on site
complete sampling on: 150020, 15006701
1520 - offsite to ship samples.
1600 - at office, CCV - end of day

Plans/Future Activities

 2/3/11
Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC 34

Project #: TR0272

Field Personnel: JVB

Water Quality Meter - Model/Serial #:

Turbidimeter - Model/Serial #

la Motte 2020e - M812153

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		2/1	0700	21.6	8.812	9.28/RN	105.1/99.8	P F
CAL ICV CCV		2/1	1720	24.10	8.903		8.605	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/1	0715	1.413	7007	3/11	1.482/1.413	P F
CAL ICV CCV		2/1	1714	6	4	4	1.465	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		2/1	0710	4.0	2003526	3/12	7.26/7.00	P F
CAL ICV CCV				7.0	2002012	1/12	3.99/4.00	P F
CAL ICV CCV				10.0	7790	3/11	9.75/9.96	P F
CAL ICV CCV		2/1	1708	4.0	same as	same as	9.13	P F
CAL ICV CCV				7.0	above	above	7.13	P F
CAL ICV CCV				9.0			9.85	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/1	0720	240 @ 25°	2244	3/15	243.4/240	P F
CAL ICV CCV		2/1	1717	"	4	4	234.7	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	2/1	9.67/10	P F
CAL ICV CCV	2/1	9.1	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: EJTCP PED

Project #: JR0272

Field Personnel: R DARRATO

Water Quality Meter - Model/Serial #: YSI 556 MPJ

Turbidimeter - Model/Serial #: LaMotte 2020 2622-1602

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV <u>CCV</u>		2/1	1720	22.6	8.472	8.55	10.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm) (uS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/1	0652	1,410	7707	03-2011	1,400 → 1,410	P F
CAL ICV <u>CCV</u>		2/1	1712	Same as above			1,474	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		2/1	0637	7.0	2002012	01/2012	7.11 → 7.00	P F
CAL ICV CCV		↓	0644	10.0	7796	2-17-2011	9.82 → 10.0	P F
CAL ICV CCV		↓	0649	4.0	2002026	3-2012	3.62 → 3.94	P F
CAL ICV <u>CCV</u>		↓	1705	7.0	2002012	JAN 2012	7.14	P F
CAL ICV <u>CCV</u>		2/1	1710	4.0	2002026	3-2012	4.12	P F
CAL ICV CCV								P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/1/11	0654	240mV	2244	02/2015	240.5 → 240	P F
CAL ICV CCV		2/1/11	1715	Same as above			232.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	2/1	0.957	P F
CAL ICV CCV		0.77	P F
CAL ICV <u>CCV</u>	2/1	0.90	P F
CAL ICV CCV			P F

11 - 40 NTU Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV	2/1	10.277	P F
CAL ICV CCV		9.98	P F
CAL ICV <u>CCV</u>	2/1	11	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: DR0272

Field Personnel: J. BARNETT

Water Quality Meter - Model/Serial #: YSI 556 MPS / 08A100738

Turbidimeter - Model/Serial # LaMotte 2020e / MEI 2153

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		2/2	0700	22.6	8.644	8.09/8.64	102.8/100.0	P F
CAL ICV CCV		2/2	1718	24.6	8.325	8.1015		P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>10</u> NTU			
Acceptance Criteria: +/- 10%			
CAL ICV CCV	2/2	8.80/9.8	P F
CAL ICV CCV	2/2	11	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/2	0710	1.413	7807	3/11	1.298/1.413	P F
CAL ICV CCV		2/2	1433	"	"	"	1.563	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
Acceptance Criteria: +/- 8%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		2/2	0705	4.0	2003526	3/12	4.05/4.00	P F
CAL ICV CCV				7.0	2002012	7/12	7.08/7.00	P F
CAL ICV CCV				10.0	7796	8/11	9.96/10.0	P F
CAL ICV CCV			1722	9.0	6444	6/11	8.96	P F
CAL ICV CCV							7.08	P F
CAL ICV CCV							10.07	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/2	0715	240 @ 25°	2244	3/15	237.1/240.0	P F
CAL ICV CCV		2/2	1734	"	"	"	237.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TRO272 Field Personnel: Jan Barfus

Water Quality Meter - Model/Serial #: YSI 556 105P2373AK Turbidimeter - Model/Serial #: Lamotte 2020/26856

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		2/2/11	0700	22.00	8.744	8.97 → 8.74	102.6 → 100.0	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	0535	23.12	8.562	8.79	103.2	P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV	1.0 NTU	2/2/11	2.2 → 1.00	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	1.1	P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		2/2/11	0710	1.413	7807	03-2011	1.326 → 1.415	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	0545	"	"	"	1.299	P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV	10 NTU	2/2/11	9.6 → 10	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	9.9	P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		2/2/11	0705	4.0	7696	2/3/11	4.05 → 4.00	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	"	7.0	2002012	Jan 2012	7.00 → 7.01	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	"	10.0	7796	3/10/11	9.69 → 9.95	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	0540	4.0	Sample		4.14	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	"	7.0	as		7.04	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	"	10.0	above		9.92	P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV	NTU			P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		2/2/11	0715	240 @ 25°C	2244	03/2015	235.6 → 240.2	P F
<input checked="" type="radio"/> CAL <input checked="" type="radio"/> ICV <input checked="" type="radio"/> CCV		"	0550	"	"	"	237.1	P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV								P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV	NTU			P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F
<input type="radio"/> CAL <input type="radio"/> ICV <input type="radio"/> CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LL34

Project #: TR0272

Field Personnel: J. BARTZEL

Water Quality Meter - Model/Serial #: YSI 556 MPS - 084100738

Turbidimeter - Model/Serial #: LaMotte - M912153

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		2/3/11	0656	22.05	8.644	8.35/8.64	96.6/99.9	P F
CAL ICV CCV		2/3/11	1621	21.91	8.761	8.69	99.8	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/2/11	0708	1.413	7807	3/11	1.446/1.413	P F
CAL ICV CCV		2/3/11	1628	10	"	"	1.404	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		2/3/11	0700	4.0	2003526	3/12	3.89/4.00	P F
CAL ICV CCV				7.0	2003012	4/12	7.25/7.0	P F
CAL ICV CCV				10.0	7326	3/11	9.94/10.0	P F
CAL ICV CCV		2/3/11	1623	4.0	same		3.93	P F
CAL ICV CCV				7.0	at		7.09	P F
CAL ICV CCV				10.0	above		7.81	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/3/11	0711	240@25°	2244	3/15	238.9/240	P F
CAL ICV CCV		2/3/11	1629	"	"	"	236.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		2/3	10.48/10	P F
CAL ICV CCV		2/3	10.17	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std ___ NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

- See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TR 272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): BW0001A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) A Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geo Pump Purge Rate: ~0.15 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Selins

Time @ Start of Purging: 0828 Time @ End of Purging: 0848 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)

Water Level: 5.3 ft BTOC Total Well Depth: 26 ft BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.52 gal

screen 23-26

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>0828</u>	Start	<u>12.9</u>	<u>purge</u>								
<u>0838</u>	<u>0.5 1.25</u>	<u>23.73</u>	<u>7.39</u>	<u>1.207</u>	<u>11.7</u>	<u>0.62</u>	<u>-148.6</u>	<u>4.9</u>	<u>0.804</u>	<u>clear</u>	
<u>0843</u>	<u>1 1.75</u>	<u>23.80</u>	<u>7.43</u>	<u>1.204</u>	<u>7.30</u>	<u>0.61</u>	<u>-147.6</u>	<u>4.8</u>	<u>0.801</u>	<u>"</u>	
<u>0846</u>	<u>1.5 2.0</u>	<u>23.62</u>	<u>7.44</u>	<u>1.203</u>	<u>4.49</u>	<u>0.61</u>	<u>-153.3</u>	<u>0.41</u>	<u>0.802</u>	<u>"</u>	
<u>0848</u>	<u>2 2.25</u>	<u>23.75</u>	<u>7.45</u>	<u>1.203</u>	<u>5.68</u>	<u>0.61</u>	<u>-154.2</u>	<u>0.40</u>	<u>0.801</u>	<u>"</u>	
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001A-024.5-20110201 Sample ID: _____ Time Collected: 0848 Comments: VOL, nBA

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{for } 1/4" \rightarrow (0.0026 \text{ gal/ft})(36 \text{ ft}) + 0.25 \text{ gal} = 0.34 \text{ gal} \sim 1.04 \text{ cpl}$
 ~~$0.041(0.035 \times 36) + 0.5(0.2) = \text{for } 3/8" \rightarrow (0.006 \text{ gal/ft})(36) = 0.216 \text{ gal} + 0.25 = 0.466 \text{ gal}$~~

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): BW0001B Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 400.15 gpm Water Quality Meter (Make & Model) YSI 1556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 0916 Time @ End of Purging: 0936 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 31.5 ft. (BTOC)

Water Level: 5.4' BTOL Total Well Depth: 33 ft BLS Reference: TOL Well diameter: 3.5 3/4 in. Volume in well: 0.66 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

screen 30-33 ft BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0916	Start	begin	purge								
0926	0.5 1.0	24.00	7.50	2.339	14.8	1.22	-154.9	0.46	1.549	clear	
0930	1 1.25	24.03	7.50	2.329	12.9	1.22	-150.9	0.41	1.541	"	
0933	1.5 1.5	24.02	7.50	2.316	8.09	1.21	-147.3	0.36	1.534	"	
0936	2 2.0	24.00	7.49	2.310	9.86	1.21	-145.9	0.33	1.531	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001B-031.5-20110201 Time Collected: 0936 Comments: VOL, WBA

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + 0.5(\text{flow tru vol}) = \text{gal}$
~~for 3/8" → (0.0009 gal/ft) (43 ft) + 0.25 gal = 0.51 gal~~ for 1/4" → (0.0026 gal/ft) (43 ft) + 0.25 gal = 0.36 gal ~ 1.10 gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0772 Task: _____ Date: 2/1/14 Sampled By: J. BARTLETT

Station (Well ID): BW0001C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Grump Purge Rate: ~0.15 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1013 Time @ End of Purging: 1031 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.89 ft BTOC Total Well Depth: 40 ft BVS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.8 gal

Screen 87-40 ft BVS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1013	Start	<u>begin purge</u>									
1021	0.5 1.0	24.45	7.60	2.666	20.2	1.40	-165.6	0.37	1.761	clear	
1025	1 1.5	24.51	7.55	2.812	9.35	1.47	-161.4	0.28	1.849	"	
1028	1.5 1.75	24.42	7.53	2.847	8.78	1.49	-157.5	0.28	1.873	"	
1031	2 2.0	24.37	7.52	2.876	8.15	1.51	-150.1	0.28	1.895	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001C-038.5-20110201 Time Collected: 1031 Comments: VOC, nBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

~~for 3/16" → (0.006 gal/ft) (50 ft) + 0.25 gal = 0.55 gal~~ for 1/4" → (0.0026 gal/ft) (50 ft) + 0.25 gal = 0.38 gal ~ 1.14 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): RW0001D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.15 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1245 Time @ End of Purging: 1307 Total Purging Time: 22 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)

Water Level: 5.8 ft BTOC Total Well Depth: 47 ft BLS Reference: 70C Well diameter: 3/4" in. Volume in well: 0.94 gal

Screen 44-47 ft BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1245	Start	begin	purge								
1250	0.5 1.0	25.12	7.41	3.204	10.95	1.07	-120.6	0.43	2.080	clear	
1300	1 1.25	25.14	7.40	3.191	10.29	1.06	-125.2	0.40	2.069	"	
1304	1.5 1.5	25.10	7.37	3.191	7.54	1.06	-123.3	0.39	2.069	"	
1307	2 1.8	25.16	7.36	3.194	4.89	1.06	-121.0	0.36	2.071	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001D-045.5-20110201 Time Collected: 1307 Comments: VOC, WBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = _____ gal

For 1/4" → (0.0076 gal/ft) (57 ft) + 0.25 gal = 0.40 gal ~ 1.2 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): BW0001E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): GeoPump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1330 Time @ End of Purging: 1346 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 5.68 ft BTOC Total Well Depth: 54 ft BLS Reference: BTC Well diameter: 3/4 in. Volume in well: 1.08 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
3/4" → 0.02 gal/ft
 Screen 51-54 ft BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1330	Start	begin purge									
1338	0.5	24.84	7.74	2.694	14.4	1.39	-154.3	0.52	1.755	clear	
1341	1	24.89	7.72	2.702	11.3	1.40	-162.3	0.52	1.759	"	
1344	1.5	24.90	7.69	2.705	9.67	1.40	-153.3	0.47	1.761	"	
1346	2	24.93	7.67	2.706		1.40	-150.1	0.37	1.763	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001E-052.5-20110201
 Sample ID: _____ Time Collected: 1346 Comments: VOC, nBA

When using 3/4-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + 0.5(\text{flow thru vol}) = \text{gal}$
 for 3/4" → $(0.0026 \times 1/4) (54 \text{ ft}) + 0.25 \text{ gal} = 0.42 \text{ gal} \sim 1.25 \text{ gal}$

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): BW0001P Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MFS Water Level Meter: Solinst

Time @ Start of Purging: 1412 Time @ End of Purging: 1430 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 57.5 ft. (BTOC)

Water Level: 6.11 ft. BTOC Total Well Depth: 61 ft BLS Reference: TOC Well diameter: 3/4" in. Volume in well: 1.22 gal
screen 58-61 ft. BLS 3/4" → 0.02 gal/ft
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1412	Start	begin	Purge								
1422	0.5 1.0	24.92	7.72	2.791	6.10	1.45	-163.4	0.39	1.817	clear	
1425	1 1.25	24.96	7.67	2.806	7.01	1.45	-151.8	0.40	1.820	"	
1427	1.5 1.5	24.96	7.65	2.809	8.84	1.45	-153.5	0.38	1.827	"	
1430	2 1.8	24.91	7.64	2.809	8.62	1.46	-152.0	0.37	1.827	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001P-059.5-2010201 Time Collected: 1430 Comments: VOC, nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

for 1/4" → (0.0026 gal/ft) (71 ft) + 0.25 gal = 0.44 gal ~ 1.3 gal

Monitor Well Sampling

Site: LC34 Project No.: JR0272 Task: --- Date: 02/01/11 Sampled By: R DARRATO
 Station (Well ID): DW0002A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): GEOPUMP Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Solinst
 Time @ Start of Purging: 1400 Time @ End of Purging: 1419 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)
 Water Level: 5.42 ft Total Well Depth: 26 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 0.52 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1400	Start	24.61	8.10	1.146	12.0	0.57	-126.3	2.5	0.855	0	
1405	0.5	24.69	7.51	1.261	1.89	0.63	-162.9	0.33	0.827	↑	
1410	1	24.74	7.46	1.286	1.83	0.64	-167.0	0.28	0.840	↓	
1413	1.3	24.72	7.44	1.286	1.91	0.64	-168.8	0.23	0.840	↓	
1416	1.6	24.70	7.44	1.284	1.48	0.64	-170.1	0.20	0.839	↓	
1419	1.9	24.70	7.44	1.283	1.26	0.64	-170.2	0.19	0.839	↓	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - DW0002A - 024.5 - 20110201
 Sample ID: _____ Time Collected: 1419 Comments: VOCS + n DA
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal
 $0.041 \times 26 \times 30 = 0.078 + 0.5 = 0.578 \text{ gal} \quad \text{AD} = 1.73$

Monitor Well Sampling

Site: LC24 Project No.: TR0232 Task: --- Date: 02/01/11 Sampled By: R. DAIKATO
 Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): GEOLAMP Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YUI 556 MAJ Water Level Meter: SOLINAT
 Time @ Start of Purging: 1324 Time @ End of Purging: 1342 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 32.5 ft. (BTOC)
 Water Level: 5.65 ft Total Well Depth: 33 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 0.166 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1324	Start	24.78	7.91	0.903	39.2	0.76	-162.0	2.89	0.998	0.1	
1329	0.5	24.62	7.61	1.961	6.72	1.01	-158.1	0.38	1.24	↑ ↓	
1334	1	24.69	7.58	2.075	3.01	1.06	-170.9	0.37	1.359		
1337	1.3	24.66	7.57	2.04	6.38	1.07	-175.1	0.38	1.371		
1340	1.6	24.64	7.55	2.103	5.38	1.08	-181.5	0.32	1.376		
1342	1.8	24.70	7.56	2.112	3.65	1.08	-182.9	0.30	1.381		
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC24-BW0002-031,5-20110201 Time Collected: 1342 Comments: VOCs + nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
 $0.0026 \times 97.4 - 0.096 + 0.5 = 0.596 \text{ gal} \times 2 = 1.178 \text{ gal}$

Monitor Well Sampling

Site: LC04 Project No.: TR0272 Task: — Date: 2/1/11 Sampled By: R. VAPARATO
 Station (Well ID): BW0002C Purge Method: Pump Bailer — Pump Type: — Submersible (— Teflon — SS — Other) X Peristaltic — Centrifugal — Bladder
 Pump (Make & Model): DEOLME Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MFS Water Level Meter: SOLVENT
 Time @ Start of Purging: 1247 Time @ End of Purging: 1307 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 30.5 ft. (BTOC)
 Water Level: 6.17 ft Total Well Depth: 40 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 0.8 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1247	Start	24.91	7.52	1.922	60.4	0.95	-79.3	2.5	1.265	cloudy	
1252	0.5	24.72	7.70	2.419	21.0	1.25	-161.5	0.55	1.588	clear	
1257	1	24.72	7.67	2.499	4.76	1.29	-174.7	0.36	1.627	clear	
1300	1.5	24.70	7.68	2.555	0.24	1.32	-192.1	0.42	1.672	↑	
1302	2	24.75	7.68	2.593	0.0	1.33	-194.5	0.37	1.674	↓	
1305	2.5	24.70	7.69	2.617	0.0	1.36	-196.9	0.37	1.712		
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC04 - BW0002C - 0385 - 20110201
 Sample ID: LC04-BW0002C-0385-20110201 Time Collected: 1307 Comments: WQA Lab Note 2020c for turbidity
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal
0.25 in tubing = 0.0026 gal/ft x 40 = 0.104 x 3 = 0.312
WQA + NBA

Monito. Well Sampling

Site: LC04 Project No.: TR0272 Task: --- Date: 2/1/11 Sampled By: R. DAIKATO
 Station (Well ID): BW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): GEOLUMP Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MDS Water Level Meter: SOLENT
 Time @ Start of Purging: 1014 Time @ End of Purging: 1038 Total Purging Time: 24 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 5.95 ft Total Well Depth: 47 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 0.94 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1014	Start	24.14	7.68	2.300	33.8	1.22	-74.5	2.45	1.565	clear	
1019	0.5	24.24	7.66	2.594	20.7	1.36	-147.2	0.75	1.711	clear	
1024	1	24.09	7.65	2.641	1.70	1.29	-154.3	0.60	1.750	clear	
1029	1.5	24.20	7.63	2.671	0.0	1.40	-151.8	0.50	1.762	↑	
1032	2.18	24.27	7.61	2.670	0.0	1.41	-151.1	0.42	1.766	↓	
1034	2.52.0	24.11	7.61	2.678	0.0	1.41	-152.4	0.38	1.769		
1038	3.2.4	24.32	7.61	2.653	0.0	1.41	-150.6	0.35	1.767		

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 - Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 - Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC04-BW0002D-045.5-20110201
 Sample ID: --- Time Collected: 1038 Comments: VOCs + NDA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal
~~0.006 x 47 = 0.28 10.5 = 0.78 = 2.4 gal~~
 0.25 inch tubing = 0.0026 gal/ft
 0.0026 x 47 = 0.12 + 0.95 = 0.62 gal

Monitor Well Sampling

Site: LC24 Project No.: TR0272 Task: — Date: 2/1/11 Sampled By: R DAIRARD
 Station (Well ID): DW0002E Purge Method: Pump Bailer — Pump Type: — Submersible (— Teflon — SS — Other) — Peristaltic X Centrifugal — Bladder
 Pump (Make & Model): BEOLUMP Purge Rate: ≈ 0.1 gpm Water Quality Meter (Make & Model) YSI 554 MP3 Water Level Meter: 50 LPT-20T
 Time @ Start of Purging: 0922 Time @ End of Purging: 0952 Total Purging Time: 30 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 6.12 ft Total Well Depth: 54 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 1.08 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0922	Start	20.74	7.56	2.570	19.5	1.27	-106.6	2.34	1.720	cloudy/grey	
0930	0.5 0.8	20.75	7.55	2.600	30.4	1.27	-160.5	0.70	1.735	grey	
0935	1.3	20.65	7.55	2.601	13.8	1.28	-162.5	0.60	1.735	clear	
0940	1.8	20.67	7.56	2.600	22.0	1.27	-163.3	0.54	1.726	clear	
0945	2.3	20.62	7.57	2.601	6.68	1.38	-156.8	0.48	1.735	clear	
0948	2.8	20.64	7.57	2.603	6.27	1.38	-154.2	0.47	1.728	clear	
0950	3.3	20.66	7.58	2.602	10.67	1.28	-154.7	0.40	1.726	clear	
0952	3.8 2.7	20.67	7.58	2.602	7.49	1.38	-154.4	0.41	1.726	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC24-DW0002E-052.5-20110201
 Sample ID: 0952 Time Collected: 0952 Comments: VOCs + NDA
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal
 $3/4 - 0.006 \text{ gal/ft} \times 60 \text{ ft} = 0.24 \text{ gal} + 0.5 = 0.74 \text{ gal}$
 $0.25 = 0.0026 \text{ gal/ft} \times 11 \text{ ft} = 0.0286 \text{ gal}$
 $= 0.656 \text{ gal}$

Monitoring Well Sampling

Site: LC24 Project No.: TR0272 Task: --- Date: 2/1 Sampled By: R DIARRATO
 Station (Well ID): BW0002F Purge Method: Pump Bailor Pump Type: --- Submersible (--- Teflon --- SS --- Other) --- Peristaltic X Centrifugal --- Bladder
 Pump (Make & Model): SEOPUMP Purge Rate: 6.1 gpm Water Quality Meter (Make & Model) YSI 556 MDS Water Level Meter: SOLVENT
 Time @ Start of Purging: 0827 Time @ End of Purging: 0857 Total Purging Time: 30 min Depth of Pump or Intake Tubing: 59.5 ft. (BTOC)
 Water Level: 6.1 ft Total Well Depth: 61 ft Reference: TOC Well diameter: 3/4 in. Volume in well: 1.22 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0827	Start										
0830	0.5	22.89	6.49	2.57	56.3	1.40	-13.9	1.45	1.367	clear	cloudy
0837	1	22.16	6.97	2.112	9.26	1.44	-74.1	0.64	1.104	clear	
0842	1.5	22.98	6.507	2.2674	3.03	1.44	-88.0	0.58	1.108	clear	
0844	2.17	22.00	7.17	2.675	2.90	1.44	-92.1	0.55	1.107	clear	
0846	2.519	22.16	7.22	2.671	2.61	1.44	-92.7	0.52	1.106	clear	
0848	3.20	22.06	7.25	2.670	2.38	1.45	-95.4	0.52	1.112	clear	
0852	2.5	22.88	7.31	2.677	2.16	1.45	-102.9	0.52	1.114	clear	
0854	2.7	22.56	7.30	2.672	2.22	1.45	-105.6	0.52	1.114	clear	
0857	3.0	22.90	7.37	2.674	2.16	1.45	-105.5	0.52	1.115	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC24-BW0002-0595-20020201 Time Collected: 0857 Comments: VOE SW / NBA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
~~0.102 - 0.006 gal/ft * 70 ft = 0.92 gal + 0.5 = 0.92 gal~~
 0.25 min < 0.0026 gal/ft
 0.0026 * 70 = 0.18 = 0.68 gal

Monitoring Well Sampling

Site: LC 34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT
 Station (Well ID): BW0003A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1454 Time @ End of Purging: 1511 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)
 Water Level: 5.47 ft B70L Total Well Depth: 26 ft BLS Reference: TOL Well diameter: 3/4 in. Volume in well: 0.52 gal
screen 23-26 ft BLS Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1454	Start	<u>begin purge</u>									
1503	0.5 0.8	24.40	7.52	9.21 1.425	9.21	0.72	-151.0	0.50	0.938	clear	
1506	1.2 1.08	24.36	7.46	1.434	9.56	0.73	-153.8	0.39	0.944	"	
1508	1.5 1.5	24.32	7.45	1.439	9.78	0.73	-155.4	0.39	0.948	"	
1511	2 1.75	24.34	7.43	1.442	10.26	0.73	-151.9	0.35	0.950	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003A - 024.5-20110201
 Sample ID: _____ Time Collected: 1511 Comments: VOC, nBA
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow tru vol) = _____ gal
3/4" → (0.0026 gal/ft) (36 ft) + 0.25 gal = 0.34 gal ~ 1.0 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/1/11 Sampled By: J. BARTLETT

Station (Well ID): BW0003B Purge Method: Pump Bailor _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1531 Time @ End of Purging: 1552 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 31.5 ft. (BTOC)

Water Level: 5.61 ft. BTOC Total Well Depth: 33 ft. ALS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.66 gal

Screen 30-33 ft. ALS

*For 3/4" → 0.02 gal/ft
Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)*

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1531	Start	<i>begin purge</i>									
1539	0.5 0.8	24.37	7.71	1.931	35.5	0.99	-168.5	0.31	1.269	clear	
1542	1 1.0	24.35	7.70	1.923	34.1	0.99	-174.0	0.28	1.264	"	
1546	1.5 1.5	24.36	7.68	1.904	23.5	0.98	-176.9	0.23	1.253	"	
1548	2 1.7	24.35	7.67	1.899	18.9	0.98	-187.4	0.24	1.250	"	
1550	2.5 1.8	24.37	7.66	1.896	15.3	0.97	-193.0	0.24	1.248	"	
1552	3 2.0	24.35	7.66	1.891	13.4	0.97	-196.9	0.22	1.245	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003B-031.5-20110201 Time Collected: 1552 Comments: VOC, nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$\frac{3}{16} \rightarrow (0.0024 \text{ gal/ft})(43 \text{ ft}) + 0.25 \text{ gal} = 0.34 \text{ gal} \sim 1.08 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): BW0003C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1245 Time @ End of Purging: 1305 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.66' Total Well Depth: 40 Reference: TOC Well diameter: 0.5 in. Volume in well: NA

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1245</u>	Start	<u>24.02</u>	<u>7.70</u>	<u>1.696</u>	<u>13</u>	<u>0.92</u>	<u>-34.8</u>	<u>0.97</u>	<u>1.228</u>	<u>clear</u>	
<u>1250</u>	<u>0.5</u>	<u>24.00</u>	<u>7.67</u>	<u>2.205</u>	<u>4.9</u>	<u>0.46</u>	<u>-102.0</u>	<u>0.46</u>	<u>1.468</u>	<u>u</u>	
<u>1255</u>	<u>1</u>	<u>23.96</u>	<u>7.72</u>	<u>2.381</u>	<u>5.3</u>	<u>0.25</u>	<u>-136.8</u>	<u>0.22</u>	<u>1.581</u>	<u>u</u>	
<u>1300</u>	<u>1.5</u>	<u>23.92</u>	<u>7.73</u>	<u>2.402</u>	<u>7.7</u>	<u>1.26</u>	<u>-141.9</u>	<u>0.18</u>	<u>1.594</u>	<u>u</u>	
<u>1305</u>	<u>2</u>	<u>23.94</u>	<u>7.73</u>	<u>2.417</u>	<u>7.0</u>	<u>1.27</u>	<u>-143.2</u>	<u>0.20</u>	<u>1.604</u>	<u>u</u>	
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-038.5-2040202 Time Collected: 1310-1305 Comments: VOCs, y B A
 When using 2.16-in. ID tubing EV = $(\frac{0.041}{0.0026}) (0.035x \text{ tubing length}) + 0.5(\text{flow thru vol}) = 0.3 \text{ gal}$
0.0026 42 0.25 0.25

Monitor Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): BW00030 Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1315 Time @ End of Purging: 1335 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 6.70' Total Well Depth: 47 Reference: TOC Well diameter: 0.5 in. Volume in well: N/A

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1315	Start	23.92	7.75	2.420	60	1.27	-107.5	0.48	1.605	Gray	
1320	0.5	24.03	7.73	2.491	17	1.31	-115.2	0.29	1.656	clear	
1325	1	24.02	7.72	2.534	12	1.33	-116.4	0.25	1.683	"	
1330	1.5	24.02	7.71	2.570	6.8	1.35	-114.4	0.22	1.704	"	
1335	2	24.01	7.71	2.585	5.1	1.36	-114.6	0.21	1.714	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW00030-045.5-20110202 Time Collected: 1335 Comments: VOCs, nBA
 When using 3/16-in. ID tubing EV= ~~(0.041)~~ (0.035x tubing length)+0.5(flow tru vol) 0.3 gal
0.0026 50 0.25 0.25

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: — Date: 02/01/2011 Sampled By: R. VARRATO
 Station (Well ID): BW0003E Purge Method: Pump Bailer — Pump Type: — Submersible (— Teflon — SS — Other) — Peristaltic X Centrifugal — Bladder
 Pump (Make & Model): GEO PUMP Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPJ Water Level Meter: SOLUBEST
 Time @ Start of Purging: 1518 Time @ End of Purging: 1538 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 6.64 ft Total Well Depth: 54 ft Reference: TOC Well diameter: 2 1/4 in. Volume in well: 1.85 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1518	Start	22.99	7.63	2.272	6.5	1.24	-485	2.02	1.609	cloudy	
1523	0.5	24.03	7.63	2.591	2.7	1.26	-106.0	0.87	1.717	clear	
1528	1	24.12	7.65	2.618	8.4	1.28	-134.6	0.40	1.731	↑	
1533	1.5	24.10	7.65	2.619	4.6	1.38	-139.8	0.35	1.732	↓	
1535	2.17	24.20	7.65	2.622	3.9	1.38	-144.5	0.32	1.730	↓	
1538	2.52.0	24.20	7.65	2.629	2.9	1.38	-148.7	0.32	1.735	↓	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20110201 Time Collected: 1538 Comments: VOCs + TOC
 When using 2 1/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal
 $0.0026 \times 60 = 0.156 + 0.5 = 0.656 \text{ gal} \times 2 = 1.96 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: — Date: 02/01/11 Sampled By: R. DAKATO
 Station (Well ID): DW0003F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): BEOPump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MK2 Water Level Meter: Schmidt
 Time @ Start of Purging: 1440 Time @ End of Purging: 1501 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 57.5 ~~60~~ ft. (BTOC)
 Water Level: 5.93 ft Total Well Depth: 61A Reference: TOC Well diameter: 3/4 in. Volume in well: 1.22 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1440	Start	24.64	7.51	2,688	8.5	1.40	-55.1	1.70	1,765	clear	
1445	0.5	24.38	7.59	2,791	5.2	1.46	-123.1	0.24	1,832		
1450	1	24.44	7.60	2,802	2.6	1.47	-128.5	0.25	1,841		
1455	1.5	24.27	7.60	2,802	2.2	1.47	-141.1	0.26	1,845		
1457	2.1	24.21	7.61	2,804	2.5	1.47	-142.0	0.25	1,847		
1459	2.5	24.30	7.60	2,806	2.6	1.47	-141.1	0.24	1,849		
1501	3.1	24.27	7.61	2,803	2.4	1.47	-142.0	0.24	1,848		

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-DW0003F-059.5-20110201 Time Collected: 1501 Comments: VOCs & nDA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)= gal
 $0.0026 \times 65 = 0.143 = 0.143 \text{ gal}$ $AD = 1.929 \text{ gal}$

Monitor Well Sampling

Site: LC34 Project No.: TRO 272 Task: _____ Date: 2/3/11 Sampled By: J. BARTLETT

Station (Well ID): W00025 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Geotech Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 0830 Time @ End of Purging: 0846 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 27.5 ft. (BTOC)

Water Level: 5.98 ft. BTOC Total Well Depth: 80 ft. BLS Reference: 70C Well diameter: 2 in. Volume in well: 4.89 gal

Screen 25-30 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0830	Start	<u>begin purg</u>									
0837	0.5 1.0	23.95	7.26	1.211	11.6	0.61	-127.1	0.64	0.804	clear	
0840	1 1.5	23.99	7.27	1.222	10.53	0.62	-125.8	0.67	0.812	"	
0843	1.5 1.9	23.89	7.29	1.236	12.2	0.63	-135.4	0.63	0.822	"	
0846	2 2.1	24.03	7.30	1.246	10.28	0.63	-137.9	0.61	0.827	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-W00025-027.5-20110203 Time Collected: 0846 Comments: VOC, nBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

$(0.041)(0.035)(40) + 0.75 = 0.31 \text{ gal} \times 3 = 0.97 \text{ gal}$

Monitor Well Sampling

Site: LC34 Project No.: JR0272 Task: _____ Date: 2/2/11 Sampled By: J. Bartlett

Station (Well ID): IW0002D Purge Method: Pump Bailor _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Grump Green Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 506 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1445 Time @ End of Purging: 1459 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)

Water Level: 6.31 ft. BTOC Total Well Depth: 40 ft. BGS Reference: T02 Well diameter: 2 in. Volume in well: 6.52 gal

Screen 35-40 ft. BGS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1445	Start	<i>begin purge</i>									
1451	0.5 0.75	24.58	7.38	2.705	5.02	1.41	-84.7	0.52	1.781	clear	
1455	1 1.25	24.61	7.38	2.763	4.42	1.44	-90.9	0.48	1.813	"	
1457	1.5 1.5	24.65	7.38	2.772	4.23	1.44	-92.3	0.45	1.816	"	
1459	2 1.75	24.62	7.38	2.814	5.97	1.47	-94.8	0.42	1.842	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0002D-0375-20110202 Time Collected: 1459 Comments: VOC, nBA

When using 2 1/8-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

$(0.041)(0.035)(50) + 0.25 = 0.32 \text{ gal} \times 3 = 0.96 \text{ gal}$

fuel conductivity CCV

Monitor Well Sampling

Site: CC34 Project No.: TR0272 Task: _____ Date: 2/2/11 Sampled By: J. BARTLETT

Station (Well ID): IW0002D1 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Oregump Hestek Purge Rate: 200 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Selinst

Time @ Start of Purging: 1406 Time @ End of Purging: 1423 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 6.52 ft. BTOC Total Well Depth: 55 ft. BW Reference: TOC Well diameter: 2 in. Volume in well: 8.9 gal

screen 50-55 ft. BWS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1406	Start	begin purge									
1415	0.5 1.0	24.59	7.72	2.860	21.2	1.50	-69.8	0.86	1.877	clear	
1418	1 1.5	24.61	7.70	2.915	10.85	1.53	-81.1	0.59	1.912	"	
1421	1.5 1.8	24.57	7.70	2.939	7.43	1.54	-86.2	0.53	1.927	"	
1423	2 2.0	24.56	7.70	2.944	6.24	1.54	-90.0	0.49	1.929	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: CC34-IW0002D1-052.5-20110202 Time Collected: 1423 Comments: VOL, uBA

When using 2 1/2-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$(0.041)(0.035)(65) + 0.25 = 0.34 \text{ gal} \times 3 = 1.03 \text{ gal}$

fail conductivity CCV

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/2/11 Sampled By: J. BARTLETT

Station (Well ID): W0067D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump / Grootch Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Bolin

Time @ Start of Purging: 1037 Time @ End of Purging: 1058 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)

Water Level: 5.81 ft BTOC Total Well Depth: 43 ft Reference: 102 Well diameter: 3/4 in. Volume in well: 0.86 gal
 $\frac{3}{4} \rightarrow 0.028 \text{ ft}^3/\text{ft}$

Screen 38-43 ft

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1037	Start	begin purge									
1045	0.5 1.0	24.88	7.70	2.993	45.5	1.56	-214.4	0.53	1.950	clear	
1049	1 1.5	24.91	7.72	2.995	24.1	1.56	-230.5	0.43	1.950	"	
1052	1.5 1.9	24.94	7.73	2.996	8.93	1.56	-239.3	0.38	1.949	"	
1055	2 2.1	24.94	7.74	2.997	3.65	1.56	-246.0	0.35	1.949	"	
1058	2.5 2.5	24.98	7.74	2.997	4.06	1.56	-248.8	0.32	1.948	"	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-W0067D-040.5-20110202 Time Collected: 1058 Comments: VOC, MBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$(0.041)(0.035)(53) + 0.2 = 0.28 \text{ gal} \times 3 = 0.8 \text{ gal}$

fail conductivity CV

Monitor Well Sampling

Site: LC34 Project No.: 180272 Task: _____ Date: 2/3/11 Sampled By: J. BARTLETT

Station (Well ID): 1W0067D1 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) _____ Peristaltic X Centrifugal _____ Bladder _____

Pump (Make & Model): Greengrip Geotech Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1410 Time @ End of Purging: 1449 Total Purging Time: 39 min Depth of Pump or Intake Tubing: ~30 ft. (BTOC)

Water Level: 4.9 ft. BTOC Total Well Depth: 73 ft. BCS Reference: TBC Well diameter: 3/4 in. Volume in well: 1.5 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
for 3/4" → 0.02 gal/ft

screen 63-73 ft. BCS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1410	Start	begin purge									
	0.5										water level water cannot hit in well w/ tubing to confirm stabilization
	1										
1440	1.5 3.0	24.48	7.54	2.731	9.85	1.43	-103.4	0.30	1.793	clear	
1445	2 3.5	24.61	7.54	2.737	10.04	1.43	-98.2	0.30	1.792	"	
1449	2.5 4.0	24.63	7.53	2.738	13.6	1.43	-98.8	0.30	1.791	"	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-1W0067D1-068.0-20110203 Time Collected: 1449 Comments: VOC, nRA tubing @ ~30 ft BCS, obstructed

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$(0.041)(0.035)(89) + 0.25 = 0.37 \text{ gal} \times 3 = 1.10 \text{ gal}$

Sampling per DEP-SOP / FS 2200 GW Pump - 2.3

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: J. BARTLETT

Station (Well ID): IW0070D Purge Method: Pump Bailer Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump / Geotech Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 550 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1252 Time @ End of Purging: 1307 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)

Water Level: 5.25 ft. BTL Total Well Depth: 43 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.86 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen 98-43 A-BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1252</u>	<u>Start</u>	<u>Begin purge</u>					<u>-221.0</u>				
<u>1259</u>	<u>0.5¹ 0.8</u>	<u>25.11</u>	<u>7.73</u>	<u>3.069</u>	<u>5.04</u>	<u>1.59</u>	<u>260</u>	<u>0.68</u>	<u>1.992</u>	<u>clear</u>	
<u>1302</u>	<u>1 1.1</u>	<u>25.10</u>	<u>7.74</u>	<u>3.076</u>	<u>3.16</u>	<u>1.60</u>	<u>-229.8</u>	<u>0.60</u>	<u>1.996</u>	<u>"</u>	
<u>1305</u>	<u>1.5 1.5</u>	<u>25.10</u>	<u>7.74</u>	<u>3.076</u>	<u>2.41</u>	<u>1.60</u>	<u>-238.6</u>	<u>0.52</u>	<u>1.996</u>	<u>"</u>	
<u>1307</u>	<u>2 1.75</u>	<u>25.10</u>	<u>7.74</u>	<u>3.076</u>	<u>2.41</u>	<u>1.60</u>	<u>-241.5</u>	<u>0.46</u>	<u>1.996</u>	<u>"</u>	
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0070D-0405-20110207 Time Collected: 1307 Comments: VOC, nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$(0.041)(0.035)(53) + 0.25 = 0.33 \text{ gal} \times 3 = 0.98 \text{ gal}$

farl conductivity (CV)

Monitor Well Sampling

Site: LC24 Project No.: TR0272 Task: _____ Date: 2/2/11 Sampled By: J. BARTVET

Station (Well ID): IW007001 Purge Method: Pump Bailer Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump (heuteh) Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1318 Time @ End of Purging: 1333 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 70.0 ft. (BTOC)

Water Level: 5.55 ft. BTOC Total Well Depth: 75 ft. BLS Reference: 402 Well diameter: 3/4 in. Volume in well: 1.5

screen 65-75 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
^{3/4" → 0.02 gal/ft}

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1318	Start										
1324	0.5 0.5	24.76	7.69	3.001	10.31	1.57	-151.1	0.72	1.965	clear	
1328	1 1.0	24.71	7.69	3.082	6.93	1.61	-151.2	0.47	2.017	"	
1330	1.5 1.25	24.71	7.69	3.097	6.07	1.62	-151.2	0.41	2.025	"	
1333	2 1.5	24.70	7.69	3.103	3.53	1.63	-150.6	0.38	2.029	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC24-IW007001-070.0-20110202 Time Collected: 1333 Comments: VOL, nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$(0.041)(0.035)(85) + 0.25 = 0.39 \text{ gal} \times 3 = 1.1 \text{ gal}$

fail conductivity CCU

Monitor Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): Iw0071D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1040 Time @ End of Purging: 1100 Total Purging Time: 20 min. Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)
 Water Level: 3.02' Total Well Depth: 43 Reference: TOC Well diameter: 0.5 in. Volume in well: NA

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1040	Start	22.94	6.91	2.186	1.3	1.17	-90.7	0.75	1.491	clear	
1045	0.5	23.03	7.30	2.315	3.3	1.24	-116.3	0.26	1.564	11	
1050	1	23.06	7.49	2.330	1.3	1.25	-136.0	0.19	1.573	11	
1055	1.5	23.07	7.52	2.331	0.60	1.25	-134.5	0.18	1.573	11	
1100	2	23.10	7.54	2.331	0.95	1.29	-136.7	0.17	1.573	11	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-Iw0071D-040.5-20110202 Time Collected: 1100 Comments: VOCs, uBA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.25 (flow thru vol)=0.3 gal
45 0.25

Monitor Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): IW007101 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1105 Time @ End of Purging: 1125 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 300 70 ft. (BTOC)
 Water Level: 3.30' Total Well Depth: 75 Reference: TOC Well diameter: 0.5 in. Volume in well: NA

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1105	Start	23.03	7.67	2.131	1.2	1.14	-136.5	0.91	1.468	clear	
1110	0.5	22.97	7.62	2.342	4.2	1.25	-122.4	0.29	1.588	1	
1115	1	23.00	7.63	2.417	2.0	1.30	-114.8	0.22	1.635	1	
1120	1.5	23.02	7.64	2.446	1.2	1.31	-113.2	0.19	1.654	1	
1125	2	23.03	7.65	2.468	0.70	1.32	-112.1	0.19	1.668	1	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW007101-070.0-20110202 Time Collected: 1125 Comments: VOCs, nBA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.4 gal
78 0.25

Monitoring Well Sampling

Site: LC34 Project No.: TK0272 Task: _____ Date: 2/2/11 Sampled By: J. BARTLETT

Station (Well ID): 1W0076 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) X Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Greypump Broken Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 650 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1535 Time @ End of Purging: 1554 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 75.0 ft. (BTOC)

Water Level: 6.5 ft BTOC Total Well Depth: 80 ft BLS Reference: YOL Well diameter: 2 in. Volume in well: 13.04 gal

Screen 70-80 ft BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1535	Start	begin purge									
1543	0.5 0.75	24.13	7.68	2.895	45.6	1.53	-170.1	0.50	1.918	cloudy	
1546	1 1.0	24.16	7.68	2.925	31.6	1.55	-172.2	0.49	1.934	"	
1550	1.5 1.5	24.23	7.69	2.947	19.0	1.56	-173.7	0.43	1.945	clear	
1552	2 1.75	24.22	7.69	2.951	17.8	1.56	-173.3	0.43	1.947	"	
1554	2.5 2.0	24.25	7.69	2.954	15.6	1.56	-174.3	0.40	1.948	"	
	B										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-1W0076-075.0-2010202 Time Collected: 1554 Comments: VOL, nBA

When using 2.16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

$$(0.041)(0.035)(90) + 0.25 = 0.38 \text{ gal} (\times 3 = 1.13 \text{ gal})$$

fact conductivity cell

Monitoring Well Sampling

Site: LC34 Project No.: TRO 292 Task: _____ Date: 2/3/11 Sampled By: J. BARTLETT
 Station (Well ID): JJ0015 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Greppump Gretech Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MFS Water Level Meter: Soiltest
 Time @ Start of Purging: 0920 Time @ End of Purging: 0954 Total Purging Time: 34 min Depth of Pump or Intake Tubing: 37.0 ft. (BTOC)
 Water Level: 5.99 ft. BTOC Total Well Depth: 42 ft. BLS Reference: TOL Well diameter: 2 in. Volume in well: 6.8 gal

Screen 32-42 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0920	Start	<u>begin purge</u>									
0929	0.5 1.0	23.94	7.56	2.621	36.1	1.38	-131.4	0.52	1.742	cloudy	
0932	1 1.25	23.91	7.56	2.646	35.4	1.40	-135.0	0.52	1.758	"	
0937	1.5 1.9	24.04	7.55	2.643	35.0	1.39	-148.7	0.40	1.750	"	
0941	2 2.25	23.96	7.55	2.640	31.9	1.39	-147.9	0.34	1.751	clear	
0947	2.5 3.0	24.16	7.56	2.652	29.9	1.39	-155.1	0.30	1.752	"	
0950	3 3.4	24.15	7.56	2.653	19.1	1.39	-159.3	0.27	1.753	"	
0952	3.5	24.12	7.56	2.653	18.1	1.40	-160.7	0.27	1.754	"	
0954	3.75	24.08	7.56	2.653	15.0	1.40	-162.4	0.26	1.755	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-JJ0015-037.0-2010203
 Sample ID: _____ Time Collected: 0954 Comments: VOL, WBA

When using 2 1/2-in. ID tubing EV = ((0.041)(0.035x tubing length)) + 0.5(flow thru vol) = _____ gal
~~to 1/4" →~~ 1/4" → (0.0026 gal/ft)(52) + 0.25 = 0.38 gal x 3 = 1.16 gal

Monitoring Well Sampling

Site: U34 Project No.: TR0272 Task: _____ Date: 2/3/11 Sampled By: J. SARTLET

Station (Well ID): 550016 Purge Method: Pump Bailer Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Geotech Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1008 Time @ End of Purging: 1042 Total Purging Time: 34 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 6.15 ft BTOC Total Well Depth: 57 ft BLS Reference: 702 Well diameter: 2 in. Volume in well: 9.3 gal

Screen 47-57 ft BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1008	Start	Virgin	None								
1015	0.505	24.14	7.64	2.709	37.3	1.43	-121.4	0.58	1.794	cloudy	
1021	1.125	24.26	7.63	2.789	50.4	1.47	-133.7	0.42	1.839	"	
1029 1029	1.520	24.25	7.63	2.790	41.1	1.47	-138.9	0.31	1.840	"	
1034	2.25	24.20	7.64	2.785	21.0	1.47	-136.6	0.30	1.839	clear	
1038	2.529	24.12	7.63	2.781	16.9	1.47	-133.9	0.30	1.839	"	
1040	3.130	24.13	7.63	2.780	13.9	1.47	-131.8	0.31	1.837	"	
1042	3.1	24.18	7.63	2.779	13.7	1.46	-133.3	0.28	1.835	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

U34-550016-052.0-20110203
 Well ID: _____ Time Collected: 1042 Comments: VOL, VBA

Using 2.16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = _____ gal
 for 1/4" → (0.0076 ft³/ft) (67 ft) + 0.25 gal = 0.42 gal x 8 = 1.8 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/3/11 Sampled By: J. BARTLETT

Station (Well ID): JJ0019 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump (Geotech) Purge Rate: 70-1 gpm Water Quality Meter (Make & Model) YSI 550 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1110 Time @ End of Purging: 1149 Total Purging Time: 39 min Depth of Pump or Intake Tubing: 37.0 ft. (BTOC)

Water Level: 5.31 ft. BTOC Total Well Depth: 42 ft. BLS Reference: 702 Well diameter: 2 in. Volume in well: 6.8 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

screen 32-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1110	Start	begin purge									
1119	0.5 0.9	23.99	7.61	1.789	46.4	0.93	-135.2	0.44	1.189	cloudy	
1126	1 1.75	23.97	7.63	1.872	46.4	0.97	-145.8	0.41	1.242	"	
1129	1.5 2.0	24.06	7.63	1.885	35.2	0.98	-149.3	0.41	1.249	"	
1134	2 2.5	24.24	7.64	1.908	31.7	0.98	-150.1	0.40	1.259	"	
1138	2.5 3.0	24.14	7.64	1.915	24.0	0.99	-154.1	0.36	1.267	clear	
1145	3 4.0	24.03	7.64	1.951	15.7	1.01	-158.7	0.32	1.293	"	
1147	4.1	24.04	7.64	1.956	11.9	1.01	-158.9	0.32	1.296	"	
1149	4.2	24.12	7.64	1.965	12.0	1.02	-159.6	0.31	1.300	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-JJ0019-0370-20110203
 Sample ID: _____ Time Collected: 1149 Comments: VOL, WBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

for 1/4" → (0.0026 gal/ft) (52 ft) + 0.75 gal = 0.38 gal x 3 = 1.2 gal

Monitor. Well Sampling

Site: LC34 Project No.: TR0272 Task: _____ Date: 2/3/11 Sampled By: J. BARTLETT
 Station (Well ID): IF0020 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Geotech Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1241 Time @ End of Purging: 1357 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)
 Water Level: 5.42 ft. BTOC Total Well Depth: 57 ft. BLS Reference: 402 Well diameter: 2 in. Volume in well: 9.3 gal

Screen 47.57 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1241	Start	begin purge									
1248	0.5 0.5	23.44	7.71	2.178	29.0	1.15	-79.3	0.57	1.474	clear	
1252	1 1.0	23.50	7.66	2.323	18.0	1.23	-100.6	0.45	1.558	"	
1254	1.5 1.25	23.56	7.67	2.354	15.6	1.25	-116.3	0.39	1.575	"	
1257	2 1.75	23.44	7.68	2.360	13.0	1.25	-121.0	0.35	1.582	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-550020-052.0-20110203 Time Collected: 1357 Comments: VOL, nBA
 When using 2 1/2-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

For 1/4" → (0.0026 gal/ft) (67 ft) + 0.25 gal = 0.42 gal x 3 = 1.3 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1535 Time @ End of Purging: 1555 Total Purging Time: 20 min. Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.64' Total Well Depth: 42 Reference: TOC Well diameter: 6 in. Volume in well: NA

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1535	Start	23.99	8.26	2.424	150	1.27	21.3	1.71	1.618	4 Gray	
1540	0.5	24.01	7.97	2.628	15	1.39	17.5	0.24	1.745	clear	
1545	1	24.02	7.95	2.653	14	1.40	15.5	0.20	1.759	"	
1550	1.5	24.06	7.92	2.672	11	1.41	11.7	0.18	1.770	"	
1555	2	24.12	7.90	2.693	10	1.42	6.5	0.16	1.782	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-20110202 Time Collected: 1555 Comments: VOCs, nBA
 When using 3/16-in. ID tubing EV = $(\frac{0.0076}{0.035} \times \text{tubing length}) + (\text{flow thru vol}) = 0.2$ gal
0.0076 45 0.28 0.2

Monitor Well Sampling

Site: LC34 Project No.: TRO272 Task: _____ Date: 2/2/11 Sampled By: Jan Barfus
 Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron
 Time @ Start of Purging: 1445 Time @ End of Purging: 1515 Total Purging Time: 30 min. Depth of Pump or Intake Tubing: 52 ft. (BTOC)
 Water Level: 5.70' Total Well Depth: 57 Reference: TOC Well diameter: 6 in. Volume in well: NA

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1445	Start	24.03	8.66	2.312	270	1.21	-50.5	0.20	1.530	Gray	
1450	0.5	24.02	8.68	2.305	60	1.21	-61.8	0.20	1.526	Lt Gray	
1455	1	24.03	8.71	2.294	33	1.20	-70.9	0.20	1.519	"	
1500	1.5	24.11	8.74	2.300	15	1.20	-81.5	0.19	1.520	clear	
1505	2	24.61	8.74	2.310	12	1.19	-83.3	0.16	1.513	clear	
1510	2.5	24.59	8.76	2.308	10	1.19	-89.4	0.16	1.512	"	
1515	3	24.52	8.76	2.304	11	1.19	-81.1	0.16	1.511	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

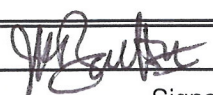
Sample ID: LC34-RW0008-0520-20110202 Time Collected: 1515 Comments: VOCS, u B A
 When using 3/16-in. ID tubing EV = $(\frac{0.041}{0.0026}) \times (0.035 \times \text{tubing length}) + 0.26$ (flow thru vol) = 0.26 gal
60 0.25

Project: <u>LC34</u>	Date: <u>3/22/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>06</u>
Contractors: <u>—</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern	
800 : at office , Calibrate , load vehicle -	
145 : on site - turn off system	
wells sampled : RW0007 @ 1024	
RW0008 @ 1121	
1145 : lunch	
wells sampled :	BW0002C @ 1253
	BW00012 @ 1525
	DW000201 @ 1330
	BW0003E @ 1552
	DW00020 @ 1405
	duplicate
	DW00021 @ 1434
	BW0003C @ 1621
	BW0001C @ 1501
1630 = turn on system	
1645 : offsite.	
1710 = ecv calibration — end of day	

Plans/Future Activities
- change level loggers to log data every 15 mins
- label IDW drum

 3/22/11
 Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 / ESTCP P20

Project #: TRO272

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 02L00194E

Turbidimeter - Model/Serial # Lamotte 20202 / ^{S.B.} ~~MC~~ 12553

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail	
								Acceptance Criteria: +/- 0.3mg/L	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>3/22</u>	<u>836</u>	<u>18.74</u>	<u>9.314</u>	<u>7.00</u>	<u>9.31</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>↓</u>	<u>1716</u>	<u>26.9</u>	<u>7.983</u>	<u>8.213</u>		<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail	
Std <u>10</u> NTU				
			Acceptance Criteria: +/- 10%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>3/22</u>	<u>7.11/10</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>↓</u>	<u>9.1</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail	
								Acceptance Criteria: +/- 5%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>3/22</u>	<u>853</u>	<u>1.413</u>	<u>7807</u>	<u>3/11</u>	<u>1.485/1.413</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>↓</u>	<u>1726</u>	<u>same as above</u>			<u>1.372</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail	
Std <u>NTU</u>				
			Acceptance Criteria: +/- 8%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail	
								Acceptance Criteria: +/- 0.2 SU	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>3/22</u>	<u>839</u>	<u>9.0</u>	<u>2002034</u>	<u>1/12</u>	<u>3.74/4.00</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>↓</u>	<u>7.0</u>	<u>2002019</u>	<u>1/12</u>	<u>7.3/7.0</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>↓</u>	<u>10.0</u>	<u>2002035</u>	<u>7/11</u>	<u>9.50/10.0</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>↓</u>	<u>same as above</u>			<u>4.17</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>↓</u>				<u>6.81</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>↓</u>				<u>9.83</u>	<u>P</u> <u>F</u>	

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail	
Std <u>NTU</u>				
			Acceptance Criteria: +/- 6.5%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail	
								Geosyntec Acceptance Criteria: +/- 5%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>3/22</u>	<u>855</u>	<u>240 mV @ 25°C</u>	<u>2294</u>	<u>3/15</u>	<u>252.9/240</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>↓</u>	<u>1728</u>	<u>same as above</u>			<u>232.5</u>	<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>	

>100 NTU	Date	Reading (NTU)	Pass or Fail	
Std <u>NTU</u>				
			Acceptance Criteria: +/- 5%	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>	

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration

ICV - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitor - Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump / Geotech Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 UPS Water Level Meter: Solinst

Time @ Start of Purging: 1013 Time @ End of Purging: 1029 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 6.15 FTOL Total Well Depth: 42 FT. BLS Reference: BLS Well diameter: 6 in. Volume in well: (1.461)(42) = 61.7 gal

Screen 35-42 FT. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1013	Start	Begin Purge								clear.	
1022	0.5 1.0	24.29	7.45	2.220	6.05	1.14	-96.6	2.88	1.449	"	
1026	1 1.4	24.23	7.42	2.252	4.94	1.15	-103.2	2.53	1.464	"	
1029	1.5 1.7	24.19	7.40	2.278	3.03	1.17	-109.2	2.34	1.482	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-20110322 Time Collected: 1029 Comments: VOC, VFA, Sr & T, TOC

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

1/4" → 0.0026 x 42 x 0.25 = 0.38 x 3 = 1.15 gal

Monitor. Well Sampling

Site: U34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett

Station (Well ID): HW0002I Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Gretech Guepump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1418 Time @ End of Purging: 1434 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 27.5 ft. (BTOC)

Water Level: 6.35 ft. BTOC Total Well Depth: 30 ft. BLS Reference: BLS Well diameter: 2 in. Volume in well: 0.163 x 30 = 4.9 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 25-30 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1418	Start	Begin Purge								clear	
1428	0.5 / 1.0	25.16	7.23	0.864	5.47	0.42	-148.2	0.65	0.562	"	
1431	1 / 1.3	25.20	7.24	0.874	5.82	0.43	-146.2	0.73	0.569	"	
1434	1.5 / 1.5	25.18	7.26	0.882	3.74	0.43	-145.7	0.61	0.574	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: U34-HW0002I-027.5-20110322 Time Collected: 1434 Comments: VOL + NBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$$0.041 \times 0.035 \times 40 + 0.25 = 0.13 \times 3 = 0.4 \text{ gal}$$

Monitor. Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bertlett

Station (Well ID): JW00020 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Gretech Deepump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 553 MPS Water Level Meter: Solinst.

Time @ Start of Purging: 1348 Time @ End of Purging: 1405 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)

Water Level: 6.75 ft. BTOC Total Well Depth: 40 ft. BIS Reference: BIS Well diameter: 2 in. Volume in well: 0.163 x 40 = 6.5 gal

Screen: 35-40 ft. BIS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1348	Start	24.81	7.42	1.920	6.56	0.97	-134.4	0.44	1.249	clear	
1358	0.5	24.73	7.42	1.948	11.7	0.99	-138.4	0.53	1.269	"	
1401	1	24.77	7.40	1.963	7.15	1.00	-143.6	0.48	1.278	"	
1405	1.5										
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-JW00020-037-5-2010322 Time Collected: 1405 Comments: NOL + NBA

When using 2.16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + 0.5 (flow tru vol) = gal

$0.041 \times 50 + 0.25 = 0.3 \times 3 = 1 \text{ gal}$

Monitor. Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett
 Station (Well ID): BW0001C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) A Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geotech Groupump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1446 Time @ End of Purging: 1501 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 8.2 ft - BTOL Total Well Depth: 40 ft - BLS Reference: BLS Well diameter: 1 in. Volume in well: 0.041 x 40 = 1.6 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 37-40 ft - BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1446	Start	Begin Purge				1.32				clear	
1456	0.5 1.0	24.68	7.31	2.556	6.80	1.33	-164.5	0.77	1.664	"	
1458	1 1.2	24.62	7.33	2.579	6.82	1.33	-164.0	0.65	1.678	"	
1501	1.5 1.6	24.64	7.34	2.592	4.82	1.34	-163.3	0.53	1.685	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001C-038.5-20110322 Time Collected: 1501 Comments: VOC + nBA
 When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{gal}$
 $1/4" \rightarrow 0.0026 \times 45 + 0.25 = 0.27 \times 3 = 1.1 \text{ gal}$

Monitor. Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 9/22/11 Sampled By: J. Bartlett

Station (Well ID): BW0002C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geotech / Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Colinst

Time @ Start of Purging: 1237 Time @ End of Purging: 1253 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 6.6 ft. BTOC Total Well Depth: 40 ft. BLS Reference: BLS Well diameter: 1 in. Volume in well: 0.041 x 40 = 1.6 gal

Screen: 37-40 ft. BLS Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1237	Start	<u>Basis Purge</u>								<u>clear</u>	
1247	0.5	24.67	7.71	2.517	19.3	1.30	-191.2	0.32	1.639	"	
1250	1.0	24.65	7.70	2.537	13.0	1.31	-202.4	0.39	1.650	"	
1253	1.5	24.64	7.71	2.555	7.50	1.32	-209.6	0.36	1.661	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002C-038.5-20110322 Time Collected: 1253 Comments: VOC + nBA

When using 2/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{gal}$

$1/4" \rightarrow 0.0026 \times 45 + 0.25 = 0.37 \times 3 = 1.1 \text{ gal}$

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Berfelt

Station (Well ID): BW0003C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Gotech Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 536 MPS Water Level Meter: Samst

Time @ Start of Purging: 1606 Time @ End of Purging: 1621 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 6.7 ft. BTOC Total Well Depth: 40 ft. BLS Reference: BLS Well diameter: 1 in. Volume in well: 0.041 x 40 = 1.6 gal

Screen: 37-40 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1606	Start	Begin Purge								clear	
1616	0.5 1.0	24.21	7.62	2.188	6.24	1.12	-177.1	0.18	1.423	"	
1619	1 1.3	24.18	7.56	2.197	6.45	1.12	-180.4	0.25	1.428	"	
1621	1.5 1.5	24.21	7.56	2.202	2.71	1.12	-180.8	0.24	1.431	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-038.5-20110312 Time Collected: 1621 Comments: VOC + HBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

0.0026 x 50 + 0.25 = 0.38 x 3 = 1.14 gal

Monitor Well Sampling

Site: W34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett.
 Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) XPeristaltic Centrifugal Bladder
 Pump (Make & Model): Greotech free pump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) VSI 556 UPS Water Level Meter: Solinst.
 Time @ Start of Purging: 1104 Time @ End of Purging: 1121 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 52 ft. (BTOC)
 Water Level: 6.12 ft. BTOC Total Well Depth: 57 ft. BLS Reference: BLS Well diameter: 6 in. Volume in well: 1.469 x 52 = 76 gal
 screen: 49-57 ft. BLS Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1104	Start	Begin Purge								clear	
1115	0.5 1.0	24.68	7.56	2.395	2.76	1.23	-99.4	1.05	1.557	"	
1119	1 1.4	24.56	7.56	2.397	3.68	1.23	-100.3	1.08	1.558	"	
1121	1.5 1.6	24.50	7.56	2.398	4.07	1.23	-101.7	1.02	1.559	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: W34-RW0008-052.0-20110322 Time Collected: 1121 Comments: VOL + NBA, VFA, BrqI, TOL
 When using 3/16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + 0.5 (flow thru vol) = gal

$$\frac{1}{16} \text{in} \rightarrow 0.0026 \times 67 + 0.25 = 0.177 \times 5.3 = 0.94 = 0.42 \times 3 = 1.3 \text{ gal}$$

Monitor. Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett

Station (Well ID): BW0001E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geotech Resopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1510 Time @ End of Purging: 1525 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 10 ft. BTOC Total Well Depth: 54 ft. BLS Reference: BLS Well diameter: 1 in. Volume in well: 0.041 x 54 = 2.2 gal

Screen: 51-54 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1510	Start									clean	
	Begin Purge										
1520	0.5 1.0	24.46	7.63	2.385	7.97	1.23	-154.6	0.45	1.551	"	
1523	1 1.3	24.51	7.60	2.385	6.00	1.22	-165.3	0.33	1.551	"	
1525	1.5 1.5	24.53	7.60	2.386	5.71	1.22	-155.2	0.35	1.551	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001E-052.5-20110322 Time Collected: 1525 Comments: VOL FUBA

When using 3/16-in. ID tubing $EV = ((0.041) (0.035x \text{ tubing length})) + 0.5(\text{flow tru vol}) = \text{gal}$

$1/32 \rightarrow 0.0026 \times 64 + 0.25 = 0.42 \times 3 = 1.2 \text{ gal}$

Monitor. Well Sampling

Site: L034 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett.

Station (Well ID): JW0002DI Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geotech Grepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst.

Time @ Start of Purging: 1308 ^{4.3} 1313 Time @ End of Purging: 1330 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 6.9 ft. STD Total Well Depth: 55 ft. BLS Reference: BLS Well diameter: 2 in. Volume in well: 0.163 x 55 = 9.0 gal

Screen: 50-55 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1313											
1308 1313	Start	Begin Purge									
1323	0.5 1.0	24.76	7.62	2.495	16.9	1.28	-107.6	0.50	1.621		clear
1326	1 1.2	24.66	7.57	2.493	11.0	1.28	-112.6	0.48	1.621		"
1330	1.5 1.5	24.60	7.56	2.496	8.33	1.28	-121.1	0.39	1.622		"
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-JW0002DI-052.5-20110322 Time Collected: 1330 Comments: VOL + N8A

When using 2.16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

$0.041 \times 0.035 \times 65 + 0.25 = 0.34 \times 3 = 1 \text{ cm}^3$

~~QC001-000-0~~ J.B.

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/22/11 Sampled By: J. Bartlett

Station (Well ID): BW0003E Purge Method: Pump Bailor Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Grotheer GroAuto Purge Rate: ~0.11 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1537 Time @ End of Purging: 1552 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 11.1 ft. BTOC Total Well Depth: 54 ft BLS Reference: BLS Well diameter: 1 in. Volume in well: 0.041 x 54 = 2.2 gal

gener. 51-54 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1537	Start	Begin Purge									clear
1547	0.5 1.0	24.41	7.57	2.361	6.94	1.21	-148.9	0.16	1.535	"	
1550	1 1.3	24.35	7.56	2.368	6.54	1.22	-155.9	0.26	1.539	"	
1552	1.5 1.5	24.39	7.56	2.369	5.91	1.22	-158.9	0.25	1.540	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20110322 Time Collected: 1552 Comments: VOC + n BA (Duplicate)

When using 2/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal

$1/4 \rightarrow 0.0026 \times 64 + 0.25 = 0.42 \times 3 = 1.2 \text{ gal}$


LC34-QC0001-000.0-20110322

Project: <u>LC34</u>	Date: <u>3/28/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>06</u>
Contractors: <u>—</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>Yes</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>OKM</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0630: at office, calibrate ysi, load truck, prepare paper work
stopped, got ice from fire station in industrial park on KSC.
0850: on site, ^{1/2} turn off system, set up for sampling.
sampled wells: RW0007, RW0008, RW00201, RW00020
11:35: called NASA weather — Phase II for next hour —> Lunch
1300: weather is awful — offsite, back to office.
1400: CCV

Plans/Future Activities

 03/28/11
Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 ESTCP PEO Project #: TR0272 Field Personnel: J. Bartlett

Lanette 2020 / 2022-2602

Water Quality Meter - Model/Serial #: YSI 550 MPS / 02L001942 Turbidimeter - Model/Serial # _____

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV		<u>3/28/11</u>	<u>0648</u>	<u>23.93</u>	<u>8.424</u>	<u>6.66/0.43</u>	<u>79.1/100.5</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
			<u>↓</u>	<u>1413</u>	<u>21.36</u>	<u>8.54</u>	<u>96.3</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
<u>10</u>		<u>3/28/11</u>	<u>8.73/10.0</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
		<u>↓</u>	<u>11.00</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV		<u>3/28/11</u>	<u>0700</u>	<u>1413</u>	<u>7807</u>	<u>03-2011</u>	<u>1.353/1.413</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
				<u>same</u>	<u>as above</u>		<u>1.463</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV		<u>3/28/11</u>	<u>0651</u>	<u>4.0</u>	<u>2002034</u>	<u>01-2012</u>	<u>4.10/4.00</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
			<u>↓</u>	<u>7.0</u>	<u>2002012</u>	<u>01-2012</u>	<u>7.05/7.00</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
				<u>10.0</u>	<u>1002035</u>	<u>07-2011</u>	<u>9.97/10.00</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
				<u>same as above</u>			<u>4.07</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
							<u>6.96</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV <input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV		<u>3/28/11</u>	<u>0704</u>	<u>290 @ 25</u>	<u>2244</u>	<u>03/2015</u>	<u>219.5/240.0</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
				<u>same</u>	<u>as above</u>		<u>220.7</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F
								<input type="checkbox"/> P <input type="checkbox"/> F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F
				<input type="checkbox"/> P <input type="checkbox"/> F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

Comments: _____

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: LC34 Project #: _____ Field Personnel: P. Sreemore

Water Quality Meter - Model/Serial #: YSI 556 OSD 2373 Turbidimeter - Model/Serial #: 97 Lamotte 2020

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
		<u>3/29/11</u>	<u>814</u>	<u>21.4</u>	<u>8.85</u>	<u>8.31-8.89</u>	<u>100.3</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>3/29/11</u>	<u>1300</u>	<u>22.0</u>	<u>8.74</u>	<u>8.79</u>	<u>100.5</u>	<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>10</u> NTU			
	<u>3/29/11</u>	<u>287-0.6</u>	<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
		<u>3/29/11</u>	<u>829</u>	<u>1.413</u>	<u>7807</u>	<u>3/11</u>	<u>1.272-1.412</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>3/29/11</u>	<u>1300</u>	<u>1.413</u>	<u>6</u>	<u>2</u>	<u>1.399</u>	<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std _____ NTU			
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
		<u>3/29/11</u>	<u>819</u>	<u>4</u>	<u>200234</u>	<u>2/112</u>	<u>3.33 4.00</u>	<u>P F</u>
<u>CAL ICV CCV</u>			<u>818</u>	<u>7</u>	<u>2002012</u>	<u>3/11</u>	<u>7.43-7.00</u>	<u>P F</u>
<u>CAL ICV CCV</u>				<u>10</u>	<u>1002035</u>	<u>7/12</u>	<u>90.46-10.00</u>	<u>P F</u>
<u>CAL ICV CCV</u>							<u>4.10</u>	<u>P F</u>
<u>CAL ICV CCV</u>							<u>7.10</u>	<u>P F</u>
<u>CAL ICV CCV</u>							<u>10.13</u>	<u>P F</u>

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std _____ NTU			
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

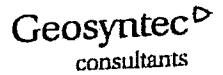
ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
		<u>3/29/11</u>	<u>825</u>	<u>240 @ 25</u>	<u>2244</u>	<u>3/15</u>	<u>297.7-240</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>11</u>	<u>1310</u>				<u>239</u>	<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>
<u>CAL ICV CCV</u>								<u>P F</u>

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std _____ NTU			
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 03/28/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): 3.3. ~~Y6P~~ Geotech Group Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MP3 Water Level Meter: Solinst

Time @ Start of Purging: 0910 Time @ End of Purging: 0926 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 6.22 ft. BTOC Total Well Depth: 42 ft. BLS Reference: 915 Well diameter: 6 in. Volume in well: 61.6 gal

screen: 35-42 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0910	Start 0	23.01	7.48	2.190	7.42	1.13	19.0	6.35	1.450	clear	
0920	0.5 1	23.25	7.41	2.572	4.49	1.33	-114.7	2.15	1.672	"	
0924	1 1.4	23.32	7.42	2.585	4.45	1.33	-126.3	1.77	1.681	"	
0926	1.5 1.6	23.24	7.43	2.595	3.71	1.34	-135.3	1.69	1.687	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-0385-20110328 Time Collected: 0926 Comments: NOC+HBA, VFA, Bp & J, TOL, Sulfide, MGC, Anions, AIC.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal

$(0.0026 \times 52 + 0.25) \times 3 = 1.15 \text{ gal}$

Duplicate: LC34-RW0002-000.0-20110328

Monitoring Well Sampling

Site: LC34 Project No.: TR0772 Task: 06 Date: 3/29/01 Sampled By: J. Battlett Pms

Station (Well ID): 1W0002 I Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geotech Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 550 MFS Water Level Meter: Solinst

Time @ Start of Purging: 1152 Time @ End of Purging: 1213 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 27.5 ft. (BTOC)

Water Level: 6.45 ft. B70C Total Well Depth: 30 ft. BLS Reference: BLS Well diameter: 2 in. Volume in well: 4.9 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 25-30 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1152	Start		7.61								
1159	0.5	24.79	7.61 Pms	2.345	6.2	1.10	-50.5	.50	1.29	Clear	
1206	1	24.80	7.62	2.346	5.9	1.12	-52.3	.49	1.30	"	
1213	1.5	24.81	7.63	2.345	4.7	1.13	-52.9	.45	1.31	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-1W0002J - 027.5 - 201103
 Sample ID: _____ Time Collected: 1213 Comments: VOC + MSA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$(0.041 \times 0.035 \times 40) + 0.5 = 0.92 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 03/28/11 Sampled By: J. Bartlett

Station (Well ID): JW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Oetech Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1108 Time @ End of Purging: 1122 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)

Water Level: 6.84 A. BTOC Total Well Depth: 40 ft. BTOC Reference: BLS Well diameter: 2 in. Volume in well: 6.5 gal

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 35-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1108	Start 0	22.89	7.82	1.168	8.07	0.60	-46.0	3.81	0.837	clear	
1118	0.5 1.0	23.32	7.46	1.871	5.34	0.95	-141.2	0.64	1.216	4	
1120	1 1.2	23.31	7.46	1.888	4.67	0.96	-145.5	0.67	1.228	"	
1122	1.5 1.4	23.31	7.46	1.897	5.49	0.96	-148.8	0.69	1.233	4	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-JW0002D-037.5-20110328 Time Collected: 1122 Comments: NBL + NBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= gal

$(0.041 \times 0.035 \times 50 + 0.25) \times 3 = 0.75 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/29 Sampled By: J. Bertlett PMS
 Station (Well ID): BW0001C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geotech Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) VSI 536 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1053 Time @ End of Purging: 1114 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.12 Total Well Depth: 40 ft. BIS Reference: BIS Well diameter: 3/4 in. Volume in well: 0.8 gal
 $0.02 \times 40 = 0.8$

Screen: 37-40 ft. BIS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1053	Start										
1100	0.5	24.62	7.50	2.092	6.5	1.07	-29.8	.80	1.35	Clear	
1107	1	24.62	7.50	2.093	5.9	1.08	-53.6	.62	1.34	"	
1114	1.5	24.63	7.50	2.093	4.9	1.08	-59.0	.49	1.34	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001C-038.5-261103
 Sample ID: _____ Time Collected: 1114 Comments: VOC + nBA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= _____ gal

1/4" → (0.0026 x 50 + 0.25) x 3 = 1.14 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/29/11 Sampled By: ~~J. Battell~~ D. Sizemore

Station (Well ID): BW0002C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geotech Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MAS Water Level Meter: Solinst
 Time @ Start of Purging: 930 Time @ End of Purging: 951 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.91 Total Well Depth: 40 ft - BLS Reference: BLS Well diameter: 3/4 in. Volume in well: 0.8 gal
 $0.02 \times 40 =$

screen : 37-40 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0930	Start										
0937	0.5	23.57	7.31	2.484	6.5	1.28	163.443	0.63	1.62	C Leds	
0944	1	23.58	7.31	2.489	5.7	1.28	165.91	0.65	1.62	"	
0951	1.5	23.57	7.31	2.490	5.1	1.28	-60.2	0.62	1.62	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002C-038.5-201103 Time Collected: 951 Comments: VOC + uBA

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{gal}$

$1/4" \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.14 \text{ gal}$

Monitoring Well Sampling

Site: U34 Project No.: TK0272 Task: 06 Date: 3/29/11 Sampled By: ~~J. Bartlett~~ D. Sizemore

Station (Well ID): BW0003C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): hatch pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 955 Time @ End of Purging: 1016 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.19 Total Well Depth: 40 ft. BLS Reference: BLS Well diameter: 3/4 in. Volume in well: 0.8 gal
0.02 x 40 =

Screen: 37.40 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
955	Start										
1002	0.5	23.62	7.48	2.495	19.4	1.39	-75.1	.55	1.59	Clear	
1009	1	23.59	7.51	2.497	9.3	1.40	-89.2	.49	1.62	"	
1016	1.5	23.60	7.50	2.502	8.9	1.40	-92.3	.42	1.62	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: U34-BW0003C-038.5-201103 Time Collected: 1016 Comments: VOC + WBA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$$1/4 \text{ gal} \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.14 \text{ gal}$$

Monitoring Well Sampling

Site: LC34 Project No.: TR0072 Task: 66 Date: 03/28/11 Sampled By: J. Bartlett

Station (Well ID): RWood 8 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geotech Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1002 Time @ End of Purging: 1019 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 6.30 A. BTOC Total Well Depth: 57 ft BLS Reference: BLS Well diameter: 6 in. Volume in well: 83.7 gal

Screen: 44-57 ft BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1002	Start 0	22.94	7.78	2.510	13.2	1.29	-61.4	1.76	1.631	clear	
1012	0.5 1.0	23.32	7.59	2.550	5.94	1.32	-125.5	0.70	1.658	"	
1015	1 1.3	23.31	7.58	2.552	4.45	1.32	-130.4	0.55	1.659	"	
1019	1.5 1.7	23.23	7.60	2.556	7.86	1.32	-117.1	0.55	1.659	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-20110328 Time Collected: 1019 Comments: VOLINSA, VFA, Br & I, TOC, Sulfide, nsg, Arsenic, Alk.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = ... gal

$(0.0026 \times 67 + 0.25) \times 3 = 1.3 \text{ gal}$

ⓐ **Monitoring Well Sampling**

Site: LC34 Project No.: TR0272 Task: 06 Date: 03/28/11 Sampled By: J. Bartlett
 Station (Well ID): IW000201 Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geotech Groupump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Coimst
 Time @ Start of Purging: 1043 Time @ End of Purging: 1057 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 8.9 ^{3.3} 52.5 ft. (BTOC)
 Water Level: 0.01 ft. BSL Total Well Depth: 55 ft. BLS Reference: BSL Well diameter: 2 in. Volume in well: 8.9 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 50-55 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1043	Start 0	23.31	8.36	1.508	18.5	0.80	-31.3	6.66	1.134	clear	
1053	0.5 1.0	23.76	7.59	2.610	10.27	1.35	-101.5	0.45	1.678	"	
1055	1 1.2	23.78	7.59	2.624	8.54	1.36	-107.7	0.41	1.707	"	
1057	1.5 1.4	23.75	7.59	2.632	7.50	1.36	-109.3	0.43	1.711	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW000201-052.5-20110328 Time Collected: 1057 Comments: VOC + nBA
 When using 2.16-in. ID tubing $EV = ((0.041)(0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{gal}$
 $(0.041 \times 0.035 \times 60 + 0.25) \times 3 = 1.0 \text{ gal}$

Monitoring Well Sampling

Site: W34 Project No.: TR0272 Task: 06 Date: 3/29/11 Sampled By: J. Bartlett DMS
 Station (Well ID): BW0001E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Gestek G20 pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1121 Time @ End of Purging: 1149 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 4.79 Total Well Depth: 54 ft. BLS Reference: BLS Well diameter: 3/4 in. Volume in well: 1.08 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 screens: 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1121	Start										
1128	0.5	25.09	7.63	2.569	21.2	1.29	-57.9	.68	1.54	Clear	
1135	1	25.10	7.64	2.572	9.3	1.33	-63.2	.43	1.59	"	
1142	1.5	25.11	7.64	2.573	9.1	1.34	-64.2	.40	1.60	"	
1149	2	25.11	7.64	2.573	8.7	1.34	-65.0	.41	1.61	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001E - 052.5 - 201103
 Sample ID: _____ Time Collected: 1149 Comments: VOC + uBA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = _____ gal
 1/4" → (0.0026 x 64 + 0.25) x 3 = 1.2 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 06 Date: 3/29/11 Sampled By: J. Santlett Dms

Station (Well ID): BW0003E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Greotech Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 550 MPS Water Level Meter: Selcons

Time @ Start of Purging: 1021 Time @ End of Purging: 1049 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 4.79 Total Well Depth: 54 ft. BLS Reference: BLS Well diameter: 3/4 in. Volume in well: 1.08 gal
 $0.02 \times 54 =$

screen: 51-54 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1021	Start										
1028	0.5	24.06	7.64	2.122	12.5	1.08	-72.09	.98	1.38	Clear	
1035	1	23.99	7.65	2.123	5.8	1.10	-92.3	.89	1.40	"	
1042	1.5	24.00	7.70	2.124	6.3	1.11	-93.2	.80	1.40	"	
1049	2	24.01	7.71	2.124	6.6	1.12	-94.0	.65	1.41	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-201103 Time Collected: 1049 Comments: VOL + WBA

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length}) + 0.5(\text{flow tru vol})) = \text{gal}$

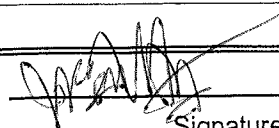
$3/4" \rightarrow (0.0026 \times 64 + 0.25) \times 3 = 1.2 \text{ gal}$

Project: <u>LC34</u> Project No.: <u>7100272</u> Contractors: <u> </u>	Date: <u>04/07/11</u> Task No.: <u>35</u>
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Work Performed	
Well Installation: _____ Soil Borings: _____ DPT: _____ Well Inventory: _____ Other: <input checked="" type="checkbox"/> <u>OKM</u>	Sampling Soil: _____ Sampling SW/Sediment: _____ Sampling Monitor Wells: <input checked="" type="checkbox"/> _____ Sampling Hazardous Waste: _____ Sampling Drums: _____

Observations/Issues of Concern
0730: at office, calibrate VSI / turbidimeter, load truck
0900: at site, begin sampling
- refer to Monitoring Well Sampling Forms for details
sampled Effluent: <u>LC34-EF0003-000.0-20110407 @ 1205 (RW0007A)</u>
<u>LC34-EF0004-000.0-20110407 @ 1205 (RW0008B)</u>
1440: complete sampling → OKM
1000 in drum 183859 <input checked="" type="checkbox"/> 60% full
pallet 183397
1530: off site.

Plans/Future Activities


 Signature/Date

Geosyntec Consultants Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: <u>YSI 556 MPS / 02L0019A2</u>		Date		Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Dissolved Oxygen								
DEP SOP FT 1500								
Acceptance Criteria: +/- 0.3mg/L								
CAL	ICV	CCV	<u>04/07/11</u>	<u>0733</u>	<u>21.33</u>	<u>9.63/8.86</u>	<u>108.7/99.9</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>1650</u>	<u>20.50</u>	<u>7.49/7.41</u>	<u>100.0</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
Specific Conductance								
DEP SOP FT 1200								
Acceptance Criteria: +/- 5%								
CAL	ICV	CCV	<u>04/07/11</u>	<u>0744</u>	<u>1.413</u>	<u>0061813</u>	<u>06-2011</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>1701</u>	<u>same</u>	<u>as above</u>	<u>1.463</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F
pH								
DEP SOP FT 1100								
Acceptance Criteria: +/- 0.2 SU								
CAL	ICV	CCV	<u>04/07/11</u>	<u>0735</u>	<u>4.0</u>	<u>2002034</u>	<u>01-2012</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>↓</u>	<u>2.0</u>	<u>2002012</u>	<u>01-2012</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>1653</u>	<u>10.0</u>	<u>1002035</u>	<u>07-2011</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>↓</u>	<u>same</u>	<u>as above</u>	<u>4.17</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV					<u>2.94</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV					<u>9.96</u>	<input type="checkbox"/> P <input type="checkbox"/> F
ORP								
SOP N/A								
Geosyntec Acceptance Criteria: +/- 5%								
CAL	ICV	CCV	<u>04/07/11</u>	<u>0750</u>	<u>240.25</u>	<u>2244</u>	<u>03-2015</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>1705</u>	<u>same</u>	<u>as above</u>	<u>240.3/240.0</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV					<u>230.5</u>	<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV						<input type="checkbox"/> P <input type="checkbox"/> F

0.1 - 10 NTU Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail		
Acceptance Criteria: +/- 10%					
CAL	ICV	CCV	<u>04/07/11</u>	<u>20.3</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
11 - 40 NTU Std <u>100</u> NTU					
Acceptance Criteria: +/- 8%					
CAL	ICV	CCV	<u>04/07/11</u>	<u>10.2</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
41 - 100 NTU Std <u>200</u> NTU					
Acceptance Criteria: +/- 6.5%					
CAL	ICV	CCV	<u>04/07/11</u>	<u>79.1</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
> 100 NTU Std <u>10</u> NTU					
Acceptance Criteria: +/- 5%					
CAL	ICV	CCV	<u>04/07/11</u>	<u>9.73</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV	<u>↓</u>	<u>9.53</u>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F
CAL	ICV	CCV			<input type="checkbox"/> P <input type="checkbox"/> F

Specific Conductance Probe Cleaned? Yes No

Dissolved Oxygen membrane Changed? Yes No

Comments: _____

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitor Well Sampling

Site: LC 34 Project No.: TR0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): RW0007 Purge Method: (Pump) Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 0938 Time @ End of Purging: 0953 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.33 ft. BTOC Total Well Depth: 42 ft. BLS Reference: TOC Well diameter: 6 in. Volume in well: NA

Screen: 35-42 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0938	Start 0	24.27	7.78	2.077	2.87	1.06	-69.8	1.24	1.365	clear	
0948	0.5 1.0	24.26	7.58	2.335	1.06	1.20	-156.7	0.34	1.518	"	
0951	1 1.3	24.31	7.57	2.336	1.15	1.20	-159.1	0.37	1.519	"	
0953	1.5 1.5	24.23	7.57	2.345	0.79	1.20	-153.8	0.38	1.524	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - RW0007 - 038.5 - 20110407
 Sample ID: _____ Time Collected: 0953 Comments: VOC plus nBA, VFA, Br & I, TOC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = _____ gal

1/4" → (0.0026 x (2.40 x 25)) x 3 = 1.2 gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): W0002t Purge Method: (Pump) Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1111 Time @ End of Purging: 1127 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 27.5 ft. (BTOC)
 Water Level: 5.54 ft. BTOC Total Well Depth: 30 ft. BLS Reference: TOC Well diameter: 2 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 25-30 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1111	Start 0	24.18	7.82	0.746	10.9	0.36	-143.5	1.44	0.490	clear	
1121	0.5 1.0	24.39	7.37	0.833	12.2	0.41	-140.7	0.42	0.541	"	
1123	1 1.2	24.61	7.37	0.840	9.37	0.41	-131.0	0.39	0.547	"	
1125	1.5 1.3	24.63	7.39	0.848	6.11	0.42	-129.2	0.38	0.552	"	
1127	2 1.5	24.53	7.40	0.851	6.06	0.42	-137.9	0.35	0.554		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-W0002t-20110407 Time Collected: 1127 Comments: VOC plus nBA,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$(0.041 \times 0.035 \times 40 + 0.25) \times 3 = 0.9 \text{ gal}$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): 1W0002D Purge Method: (Pump) Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1038 Time @ End of Purging: 1052 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)
 Water Level: 5.97 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 2 in. Volume in well: _____
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 35-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1038	Start 0	23.89	7.25	1.440	2.47	0.73	-167.0	2.36	0.971	clear	
1048	0.5 1.0	24.50	7.56	1.785	1.75	0.90	-147.2	0.39	1.161	"	
1050	1 1.2	24.59	7.00	1.798	1.50	0.91	-151.9	0.30	1.170	"	
1052	1.5 1.4	24.58	7.58	1.814	1.67	0.92	-152.9	0.27	1.180	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-1W0002D-0375-20110407
 Sample ID: _____ Time Collected: 1052 Comments: VOC plus nBA,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal
 $(0.041 \times 0.035 \times 50 + 0.25) \times 3 = 1.0 \text{ gal}$
 Duplicate: ~~LC34-20110407-03~~
 LC34-FD-20110407-01

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): BW0001C Purge Method: (Pump) Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1257 Time @ End of Purging: 1312 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 8.75 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1257	Start 0	26.06	8.13	2.321	130	1.17	-135.6	6.99	1.432	cloudy	
1307	0.5 1.0	25.18	7.51	2.485	5.04	1.25	-143.0	0.26	1.585	clear	
1309	1 1.2	25.22	7.48	2.461	3.09	1.26	-142.5	0.16	1.600	"	
1312	1.5 1.5	25.28	7.47	2.472	2.29	1.27	-140.7	0.17	1.608	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001C-0385-20110407 Time Collected: 1312 Comments: VOC plus nBA,
 When using 3/4-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)= gal

$3/4" \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.1 \text{ gal}$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): BW0002C Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1137 Time @ End of Purging: 1152 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 39.5 ft. (BTOC)
 Water Level: 7.61 A-BTL Total Well Depth: 40 ft-BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 37-40 ft-BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1137	Start 0	24.55	7.69	1.775	44.3	0.91	-103.3	3.15	1.216	cloudy	
1147	0.5 1.0	24.74	7.72	2.434	19.6	1.25	-155.3	0.30	1.584	"	
1149	1 1.2	24.75	7.74	2.456	15.3	1.26	-158.2	0.29	1.598	clear	
1152	1.5 1.5	24.76	7.75	2.484	11.6	1.28	-149.3	0.25	1.616	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34 - BW0002C - 039.5 - 20110407 Time Collected: 1152 Comments: VOC plus nBA,
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$$\frac{1}{4} \text{ in} \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.1 \text{ gal}$$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003C Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1349 Time @ End of Purging: 1404 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 6.62 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA

Screen: 37-40 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1349	Start 0	24.88	7.92	1.647	12.8	0.84	-113.1	4.09	1.097	clear	
1359	0.5 0.5	24.71	7.69	2.127	5.94	1.09	-158.5	0.10	1.383	"	
1402	1 1.3	24.71	7.70	2.145	4.33	1.09	-167.0	0.10	1.395	"	
1404	1.5 1.5	24.71	7.70	2.156	2.80	1.10	-168.2	0.12	1.401	"	
	2										
	2.5										
	3										

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
- Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
- Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-0385-20110407 Time Collected: 1404 Comments: VOC plus nBA,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal

$1/4 \text{ in} \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.1 \text{ gal}$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 0900 Time @ End of Purging: 0916 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)
 Water Level: 12.24 ft BTOC Total Well Depth: 57 ft BLS Reference: TOC Well diameter: 6 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 47-57 ft BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0900	Start 0	23.83	8.39	2.411	2.11	1.24	183.2	2.68	1.571	clear	
0910	0.5 1.0	23.98	7.68	2.456	1.37	1.26	-92.4	0.56	1.597	"	
0913	1 1.25	24.05	7.68	2.458	0.79	1.26	-102.5	0.57	1.598	"	
0916	1.5 1.5	24.15	7.68	2.464	0.78	1.27	-118.4	0.61	1.603	"	
	2										
	2.5										
	3										

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
- Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
- Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-20110407 Time Collected: 0916 Comments: VOC plus nBA, VFA, Br 9f, TOC
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)= gal

$1/4" \rightarrow (0.0026 \times 67 + 0.25) \times 3 = 1.3 \text{ gal}$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): 1W000201 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1014 Time @ End of Purging: 1029 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 6.25 ft. BTOC Total Well Depth: 55 ft. BLS Reference: TOC Well diameter: 2 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: ~~25-30~~ 50-55 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1014	Start 0	23.91	8.32	1.400	8.82	0.76	-81.4	3.62	1.127	clear	
1024	0.5 1.0	24.06	7.68	2.591	8.77	0.34	-109.9	0.30	1.685	"	
1026	1 1.2	24.09	7.68	2.592	6.13	1.34	-119.1	0.30	1.685	"	
1029	1.5 1.5	24.13	7.68	2.594	5.17	1.34	-127.3	0.29	1.687	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-1W000201-20110407 Time Collected: 1029 Comments: VOC plus nBA,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal

$(0.041 \times 0.035 \times 65 + 0.25) \times 3 = 1.0 \text{ gal}$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): BW0001E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1320 Time @ End of Purging: 1336 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 10.94 ft. BTOC Total Well Depth: 54 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1320	Start 0	24.74	7.77	2.989	42.2	1.23	-135.8	3.42	1.557	cloudy	
1330	0.5 1.0	24.88	7.70	2.501	8.35	1.29	-145.7	0.34	1.625	clear	
1333	1 1.3	24.92	7.71	2.505	5.26	1.29	-145.3	0.27	1.629	"	
1336	1.5 1.6	24.76	7.71	2.505	5.06	1.29	-138.7	0.15	1.628	"	
	2										
	2.5										
	3										

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
- Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
- Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001E-0525-20110407 Time Collected: 1336 Comments: VOC plus nBA,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = _____ gal

$$V_{4"} \rightarrow (0.0026 \times 64 + 0.25) \times 3 = 1.3 \text{ gal}$$

Monitoring Well Sampling

Site: LC 34 Project No.: TR 0272 Task: 35 Date: 04/07/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003E Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1413 Time @ End of Purging: 1429 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 13.11 ft. BTOC Total Well Depth: 54 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA

Screen: 51-54 ft. BLS

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1413	Start 0	25.78	7.80	2.455	118	1.26	-91.1	4.86	1.598	cloudy	
1423	0.5 0.0	24.96	7.75	2.477	134	1.27	-137.1	0.19	1.610	clear	
1426	1 1.3	25.09	7.74	2.481	7.24	1.28	-135.3	0.17	1.613	"	
1429	1.5 1.6	25.03	7.74	2.481	4.85	1.28	-136.4	0.17	1.612	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20110407 Time Collected: 1429 Comments: VOC plus nBA,
 When using 3/4 in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + 0.5(\text{flow thru vol}) =$ gal

$3/4" \rightarrow (0.0026 \times 64 \times 10.25) \times 3 \approx 1.3 \text{ gal}$

Project: <u>ES/CP LC34 140</u>	Date: <u>4/18/14</u>
Project No.: <u>120272</u>	Task No.: <u>35</u>
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern	
0700: met at office (JKB, EMB)	
- calibrated KSI, turbidometer	
- loaded truck.	
- left to site	
0900: on site, perform O&M, begin sampling	
Refer to Sampling forms for details	
Effluent Samples:	
RW-7 :	LC34-EP0005-000.0-20110418
RW-8 :	LC34-EP0006-000.0-20110418
	@ 1525
RW → drum ID: 18360 183860	
Pallet ID: 183327	

Plans/Future Activities


 4/18/14
 Signature/Date

Project: <u>TR0272 ES TRP PED U34</u>	Date: <u>9/14/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>35</u>
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0700: - JVB and JRB met at office. - calibrate YSI turbidimeter - load truck - leave for site.
0830: begin sampling - for details refer to sampling field forms.
0230: off site. - pack samples for shipping - CCV YSI & turbidimeter
0600: end of day

Plans/Future Activities
- install Hour Meters
- level loggers

 9/12/11
 Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272

Field Personnel: J. Bartlett

Turbidimeter - Model/Serial # HACH 2100Q / 11020C007557

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 AK

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		4/18/11	0731	23.82	8.450	1.14/8.45	84.3/99.8	P F
CAL ICV CCV		4/19/11	0719	23.12	8.562	0.53/8.47	10.8/98.8	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		4/18/11	0743	1.913	0001813	06-2011	1.412/1.413	P F
CAL ICV CCV		4/19/11	0731	↓	↓	↓	1.327/1.413	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		4/18/11	0734	4.0	2002034	01-2012	4.59/4.00	P F
CAL ICV CCV		↓	↓	7.0	2002034	01-2012	6.89/7.00	P F
CAL ICV CCV		4/19/11	0729	10.0	1002035	07-2011	10.09/10.00	P F
CAL ICV CCV		↓	↓	↓	↓	↓	4.29/4.00	P F
CAL ICV CCV		↓	↓	↓	↓	↓	7.20/7.00	P F
CAL ICV CCV		↓	↓	↓	↓	↓	9.20/10.00	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		4/18/11	0748	240 @ 25	2244	03-2015	226.7/240.0	P F
CAL ICV CCV		4/19/11	0732	240 @ 25	↓	↓	243.4/240.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/18/11	10.6	P F
CAL ICV CCV	4/19/11	10.5	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/18/11	16.11	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/18/11	98.3	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/18/11	794/10.0	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No

Dissolved Oxygen membrane Changed? Yes No

Comments: _____

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: 639

Project #: TR0272

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 AL

Turbidimeter - Model/Serial #: HACH 2100B / 11620C007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV <u>CCV</u>		<u>4/19/11</u>	<u>1755</u>	<u>21.4</u>	<u>8.866</u>	<u>9.13</u>	<u>106.4</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV <u>CCV</u>		<u>4/19/11</u>	<u>1752</u>	<u>1.913</u>	<u>006813</u>	<u>06-2011</u>	<u>1.436</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV <u>CCV</u>		<u>4/19/11</u>	<u>1750</u>	<u>4.0</u>	<u>2002034</u>	<u>01-2012</u>	<u>4.19</u>	P F
CAL ICV <u>CCV</u>				<u>7.0</u>	<u>2002012</u>	<u>01-2012</u>	<u>6.82</u>	P F
CAL ICV <u>CCV</u>				<u>10.0</u>	<u>1002035</u>	<u>07-2011</u>	<u>9.02</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV <u>CCV</u>		<u>4/19/11</u>		<u>240 @ 25</u>	<u>2244</u>	<u>03-2015</u>	<u>289.2</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV <u>CCV</u>	<u>10</u>	<u>4/19/11</u>	<u>8.60</u>	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: KTRO272 Field Personnel:

Emily Guyer / Jan Barfus

Hach 2100 Q 1011DC006392

Water Quality Meter - Model/Serial #:				Turbidimeter - Model/Serial #				
Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>22.8</u>	<u>8.611</u>	<u>98.8 → 100</u>	<u>8.50 → 8.61</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>1.413</u>	<u>8464</u>	<u>11-2011</u>	<u>1550 → 1.411</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>84</u>	<u>2007412</u>	<u>07-2012</u>	<u>3.91 → 4.00</u>	P F
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>7</u>	<u>1009529</u>	<u>09-2012</u>	<u>7.01 → 7.00</u>	P F
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>10</u>	<u>1007173</u>	<u>12-2011</u>	<u>10.04 → 10.0</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
<u>CAL</u> <u>ICV</u> CCV		<u>4.18.11</u>	<u>0745</u>	<u>240mV @ 25°C</u>	<u>2981</u>	<u>01-2010</u>	<u>250 → 240</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU ²⁰	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%					
CAL	ICV	CCV		<u>20.2 → 20</u>	P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
11 - 40 NTU ¹⁰⁰	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%					
CAL	ICV	CCV		<u>95.6 → 100</u>	P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
41 - 100 NTU ⁸⁰⁰	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%					
CAL	ICV	CCV		<u>80.9 → 800</u>	P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
>100 NTU ^{to verify}	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%					
CAL	ICV	CCV		<u>9.49 pass</u>	P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F

Lot A1052
Exp Feb 12

Lot 0295
Oct -11

Lot A1050
Exp Feb 12

Lot A1050
Exp Feb -12

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: F00552

Field Personnel: Jan Barfus

Hach 2100Q/1122662

Water Quality Meter - Model/Serial #:

YSI 556/09010399

Turbidimeter - Model/Serial #

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
		<u>4/19/11</u>	<u>0745</u>	<u>21.90</u>	<u>8.761</u>	<u>9.35 → 8.76</u>	<u>106.7 → 100.0</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV				<u>25.47</u>	<u>8.128</u>	<u>8.20</u>	<u>100.2</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
		<u>4/19/11</u>	<u>0735</u>	<u>1.413</u>	<u>0061813</u>	<u>06/30/11</u>	<u>1.642 → 1.413</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV				<u>1.1</u>	<u>1.1</u>	<u>1.1</u>	<u>1.430</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
		<u>4/19/11</u>	<u>0730</u>	<u>4.0</u>	<u>2002034</u>	<u>01-2012</u>	<u>3.93 → 3.98</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV				<u>7.0</u>	<u>2002012</u>	<u>Jan 2012</u>	<u>7.13 → 7.00</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV		<u>4/19/11</u>	<u>1700</u>	<u>10.0</u>	<u>1002035</u>	<u>07-2011</u>	<u>9.94 → 10.00</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV				<u>4.0</u>	<u>same as above</u>		<u>3.86</u>	<u>P</u> F
CAL ICV CCV				<u>7.0</u>			<u>6.99</u>	<u>P</u> F
CAL ICV CCV				<u>10.0</u>			<u>9.96</u>	<u>P</u> F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
		<u>4/19/11</u>	<u>0740</u>	<u>240 @ 25°C</u>	<u>2244</u>	<u>03-2015</u>	<u>247.1 → 224.0</u>	<u>P</u> F
<u>CAL</u> <u>ICV</u> CCV				<u>1.1</u>	<u>1.1</u>	<u>1.1</u>	<u>230.9</u>	<u>P</u> F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%					
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F

11 - 40 NTU	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%					
<u>CAL</u>	<u>ICV</u>	CCV	<u>4/19/11</u>	<u>9.47</u>	<u>P</u> F
CAL	ICV	CCV		<u>14.6</u>	P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F

41 - 100 NTU	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%					
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F

>100 NTU	Std	NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%					
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F
CAL	ICV	CCV			P F

Specific Conductance Probe Cleaned? Yes No

Dissolved Oxygen membrane Changed? Yes No

Comments:

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Gespump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Minist
 Time @ Start of Purging: 0858 Time @ End of Purging: 0917 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 3.68 ft. BTOC Total Well Depth: 42 ft. BLS Reference: TOC Well diameter: 6 in. Volume in well: 61 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0858	Start 0	begin purge									
0903	0.5	24.65	7.41	1.859	1.74	0.94	-140.3	0.81	1.211	1	
0908	1	24.61	7.42	1.893	1.62	0.96	-157.9	0.52	1.231	4	
0913	1.5	24.67	7.42	1.898	1.35	0.96	-165.5	0.46	1.233	11	
0915	2 1.7	24.73	7.42	1.899	1.29	0.96	-167.1	0.43	1.235	11	
0917	2.5 1.9	24.72	7.42	1.901	1.35	0.96	-165.5	0.41	1.236	4	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20110419
 Time Collected: 0917 Comments: VOL + nDA, VFA, Br⁻, I⁻, TOC, Sulfide, NH₄⁺, Anions, Alk,
 in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)= gal Dissolved Metals, Dicy, VFA,

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Buger
 Station (Well ID): IW0002I Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Sotinst
 Time @ Start of Purging: 1450 Time @ End of Purging: 1510 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 27.5 ft. (BTOC)
 Water Level: 5.85 Total Well Depth: 80 Reference: TOC Well diameter: 2 in. Volume in well: 4.89 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 25-30

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1450	Start				began purge						
1455	0.5	24.38	7.44	0.730	6.38	0.36	-143.7	0.27	0.475	clear	
1500	1	24.41	7.48	0.730	6.42	0.36	-142.4	0.25	0.475		
1505	1.5	24.42	7.45	0.731	5.64	0.36	-142.4	0.29	0.475		
1510	2	24.42	7.44	0.732	5.10	0.36	-140.5	0.29	0.476		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0002I-0275-2010418 Time Collected: 1510 Comments: VOC/NFA/TOC / Sulfide / MEE / Soluble Metals / Bromide / Anions / Alkalinity
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.3 gal
35 0.25

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): IW00020 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Sinist
 Time @ Start of Purging: 1443 Time @ End of Purging: 1457 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)
 Water Level: 6.25 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOL Well diameter: 2 in. Volume in well: 0.5 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1443	Start 0	Begin Purge								clear	
1453	0.5 1.0	25.95	7.81	1.229	5.54	0.61	-157.5	0.61	0.799	"	
1455	1 1.2	25.83	7.81	1.235	3.72	0.61	-159.3	0.44	0.803	"	
1457	1.5 1.4	25.89	7.80	1.239	3.77	0.61	-161.5	0.36	0.806	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW00020-037.5-20110418 Time Collected: 1457 Comments: VOL TUBA, VFA, BOD I, TOL, Sulfide, MSL, Ammonia, Alk, Dissolved M.H.s.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
 (0.041 x 0.035 x 50 + 0.25) x 3 = 1.0 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer emg
 Station (Well ID): BW0001A Purge Method: Pump Bailer _____ Pump Type: Peristaltic Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1000 Time @ End of Purging: 1020 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)
 Water Level: 5.21 Total Well Depth: 24.5 Reference: TOL Well diameter: 3/4 in. Volume in well: 0.52 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 23-26

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1000	Start										
					begin purge / clear						
1005	0.5	24.31	7.41	0.772	1.28	0.38	-154.6	0.33	0.508	clear	
1010	1	24.24	7.41	0.782	1.12	0.38	-155.1	0.31	0.509	↓	
1015	1.5	24.23	7.42	0.783	1.63	0.38	-155.5	0.30	0.509		
1020	2	24.23	7.43	0.783	1.86	0.38	-155.6	0.38	0.509		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001A-24.5-20110418 Time Collected: 1020 Comments: VOC/VFA/MEE/TDC/Sulfide/Br/I/Soluble Metals/Anions/Alk
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.29 gal
30 0.25

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer
 Station (Well ID): BWOOD021B Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1020 Time @ End of Purging: 1040 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 315 ft. (BTOC)
 Water Level: 5.32 Total Well Depth: 315 Reference: T0C Well diameter: 3/4 in. Volume in well: 0.66 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 30-33

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1020	Begin Purge		clear				-160.3				
1025	Start	24.87	7.55	1.379	1.74	0.69	-159.9	0.26	0.900	clear	
1030	0.5	24.84	7.55	1.388	2.67	0.69	-160.0	0.25	0.902	↓	
1035	1	24.81	7.55	1.390	1.92	0.69	-159.4	0.24	0.904	↓	
1040	1.5	24.84	7.55	1.391	2.30	0.670	-159.0	0.21	0.905		
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BWOOD1B-031.5-20110418 Time Collected: 1040 Comments: VOC/VFA/MEE/TDC/Sulfide/Soluble Metals/Br/I/Anions/Alk
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.30 gal
35 0.25

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer
 Station (Well ID): 10103 BW0001C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1100 Time @ End of Purging: 1120 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 5.75 Total Well Depth: 40 Reference: TUC Well diameter: 3/4 in. Volume in well: 0.8 gal
 Screen: 37-40 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1100	Start										
			began purge								
1105	0.5	25.22	7.56	1.552	15.2	0.78	-152.1	1.26	1.613	clear	
1110	1	24.85	7.46	1.909	12.9	0.97	-147.9	0.66	1.220		
1115	1.5	24.81	7.44	2.054	11.8	0.98	-146.8	0.57	1.337		
1120	2	24.90	7.43	2.062	11.8	1.05	-145.7	0.51	1.346		
	2.5					1.05					
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: 20110418 Time Collected: 1120 Comments: VOC/VFA/MEE/TOC/ANION/Soluble Metals/Sulfide/Br/I
 When using 3/4 1.6-in. ID tubing EV= ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.52 gal
45 0.25 0.31
AIK/DHC/VFA

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Gueyer
 Station (Well ID): BWOOD1D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Sotrust
 Time @ Start of Purging: 1340 Time @ End of Purging: 1400 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 6.43 Total Well Depth: 47 Reference: TOC Well diameter: 3/4 in. Volume in well: 0.94 gal
 Screen: 44-47 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
3/4" = 0.02 gal/ft

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1340	Start				began purge / clear						
1345	0.5	25.57	7.38	2.749	6.63	1.42	-125.1	0.40	1.785	clear	
1350	1	25.65	7.37	2.748	4.51	1.42	-124.3	0.33	1.787		
1355	1.5	25.63	7.37	2.751	3.61	1.42	-123.3	0.32	1.789		
1400 1400	2	25.60	7.37	2.754	3.91	1.42	-122.5	0.32	1.791		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BWOOD1D-045.5-20110918 Time Collected: 1400 Comments: VOC/VFA/TOC/Sulfide/MEE/Soluble Metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = 0.32 gal
50 0.25 BFI/Amo/Alk

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: Jan Barfus
 Station (Well ID): BW002A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): 600 pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 0900 Time @ End of Purging: 0915 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)
 Water Level: 5.57 A Total Well Depth: 26 Reference: TOC Well diameter: 1 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 23-26

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0900	Start	24.48	7.45	0.628	87.2	0.30	-151.8	0.77	0.409	cloudy	
0905	0.5	24.48	7.48	0.661	12.0	0.32	-173.3	0.19	0.430	clear	
0910	1	24.52	7.48	0.664	10.5	0.32	-172.9	0.22	0.432	11	
0915	1.5	24.52	7.49	0.665	8.38	0.32	-174.5	0.20	0.433	11	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW002A-024.5-20110419 Time Collected: 0915 Comments: VOC VFA Bromide TOC, MEE
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
LC34-FD-20110419-01

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: Jan Barfus

Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1005 Time @ End of Purging: 1020 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 31.5 ft. (BTOC)
 Water Level: 5.72 ft. Total Well Depth: 33 ft. BLS Reference: TOC Well diameter: 2 3/4 in. Volume in well: NA

BTOC Screen: 30-33

Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1005	Start	25.02	7.59	0.801	30.2	0.39	-181.4	1.33	0.521	clear	
1010	0.5	24.96	7.57	0.842	5.26	0.41	-186.2	0.32	0.556	11	
1015	1	24.94	7.58	0.879	4.12	0.43	-185.8	0.23	0.576	11	
1020	1.5	24.95	7.50	0.902	5.82	0.44	-185.9	0.20	0.588	11	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002B - 031.5 - 2010419
 Sample ID: _____ Time Collected: 1020 Comments: VOC, VFA, Bromide, TOC, MEE
 When using 3/4 6-in. ID tubing EV = ((0.041)(0.035x tubing length)) + 0.5(flow thru vol) = _____ gal
Vol = 0.0026 x 43 to 25 = 0.36 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Gargas
 Station (Well ID): BW0002C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): 622 pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1050 Time @ End of Purging: 1105 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 58.5 ft. (BTOC)
 Water Level: 6.60 ft. Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 7/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 BTOC
 Screen: 37-40

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1050	Start	25.17	7.61	1.968	16.8	1.00	-161.0	0.81	1.284	clear	
1055	0.5	25.20	7.65	2.073	5.05	1.06	-184.5	0.12	1.351	11	
1100	1	25.25	7.59	2.095	7.21	1.07	-201.5	0.11	1.363	11	
1105	1.5	25.24	7.60	2.094	5.34	1.07	-203.0	0.22	1.365	11	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002C - 0385 - 20110419
 Sample ID: _____ Time Collected: 1105 Comments: VOCs, VFAs, Bromide, TOC, sulfide, MEEs, Anions, Alkalinity
 When using 3/4 in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = _____ gal
 1/4 - 0.020 x 50 + 0.25 = 0.33 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: Jan Barfus
 Station (Well ID): BW002D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1240 Time @ End of Purging: 1305 Total Purging Time: 25 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 9.63 R Total Well Depth: 47 Reference: TOC Well diameter: 2 3/4 in. Volume in well: NR
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 BTOC
 Screen: 44-47

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1240	Start	25.16	7.90	2.010	91.7	1.02	-197.6	0.86	1.307	cloudy	
1245	0.5	25.04	7.73	1.997	21.3	1.01	-220.5	0.27	1.298	clear	
1250	1	25.09	7.69	2.043	6.06	1.04	-216.8	0.16	1.328	"	
1306	1.5	25.08	7.64	2.044	2.82	1.04	-211.6	0.15	1.339	"	
1305	2	25.10	7.68	2.045	2.63	1.04	-210.9	0.24	1.329	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW002D-0455-20110419
 Sample ID: _____ Time Collected: 1305 Comments: VOCs, VFAs, Br/I, TOC, MEE
 When using 3/4 in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = _____ gal
 FD-20110419-09 (VFAs), FD-20110419-10 (VOC), FD-20110419-04 (TOC)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1122 Time @ End of Purging: 1136 Total Purging Time: 14 min. Depth of Pump or Intake Tubing: 24.5 ft. (BTOC)
 Water Level: 5.69 Total Well Depth: 26 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.15 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 23-26 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1122	Start 0	<u>Best in pump</u>								<u>clear</u>	
1132	0.5 1.0	24.34	7.45	0.722	1.00	0.35	-182.6	1.39	0.469	"	
1134	1 1.2	24.47	7.44	0.723	0.38	0.35	-181.4	1.33	0.470	"	
1136	1.5 1.4	24.44	7.43	0.723	0.52	0.35	-180.1	1.16	0.470	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003A-024.5-20110419 Time Collected: 1136 Comments: VOC M&A, VFA, bn 9F, TOC, MEC
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = _____ gal

Duplicate: TOC (12)

Monitor Well Sampling

Site: L034 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003B Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geb pump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst.
 Time @ Start of Purging: 1309 Time @ End of Purging: 1323 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 31.5 ft. (BTOC)
 Water Level: 4.21 ft. BTL Total Well Depth: 33 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.7 gal.
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1309	Start 0	begin purge								clear	
1319	0.5 1.0	24.64	7.52	0.811	6.14	0.40	-161.8	1.17	0.527	"	
1321	1 1.2	24.65	7.46	0.821	4.57	0.40	-177.4	0.37	0.533	"	
1323	1.5 1.4	24.50	7.48	0.815	3.76	0.40	-175.7	0.34	0.529	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-BW0003B-031.5-20110419 Time Collected: 1323 Comments: VOLTA, VEA, Br 4 I, TOC, MEE
 When using 3/4 16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal (0)
 0.041 x 43 x 0.25 x 3 = 1.0 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003C Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Polinst
 Time @ Start of Purging: 1429 Time @ End of Purging: 1443 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 6.45 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.8 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1429	Start 0	begin purge								cloudy	
1439	0.5 1.0	24.78	7.58	1.594	14.1	0.80	-160.9	0.22	1.037	clear	
1441	1 1.2	24.79	7.57	1.599	9.11	0.80	-170.8	0.19	1.040	"	
1443	1.5 1.4	24.79	7.56	1.604	6.12	0.81	-176.5	0.19	1.043	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-038.5-20110419 Time Collected: 1443 Comments: Vol + n BA, VFA, Br & I, TOC, Sulfides, M&C, Anions, Alk, Dhc, vova
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
 $0.041 \rightarrow (0.0026 \times 50 + 0.25) \times 3 = 1.1 \text{ gal}$

Duplicate = MEG (11)

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1231 Time @ End of Purging: 1245 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 4.21 ft. BTOC Total Well Depth: 47 ft. BWS Reference: TOL Well diameter: 3/4 in. Volume in well: 1.0 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 44-47 ft. BWS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1231	Start 0	begin purge								cloudy	
1241	0.5 1.0	24.79	7.51	1.856	19.8	0.94	-171.5	0.37	1.207	clear	
1243	1 1.2	24.80	7.51	1.858	14.3	0.94	-174.1	0.33	1.208	u	
1245	1.5 1.4	24.84	7.51	1.859	11.1	0.94	-177.2	0.31	1.208	u	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003D - 045.5 - 20110919
 Sample ID: _____ Time Collected: 1245 Comments: VOL TR BA, VPA, BWS, TOL, MEG
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = _____ gal (10)
 $0.041 \times (0.035 \times 57 \times 10.25) \times 3 = 1.7 \text{ gal}$

Field Duplicate - Sulfide (5), Anions (6), Alk (7), Metals (8)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Selinst
 Time @ Start of Purging: 1008 Time @ End of Purging: 1027 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)
 Water Level: 9.72 ft. BTOC Total Well Depth: 57 ft. BLS Reference: TOC Well diameter: 6 in. Volume in well: 83 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47.57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1008	Start 0	begin purge								clear	
1010	0.5 1.0	25.21	7.71	1.926	2.09	0.98	-148.9	2.52	1.252	"	
1025 1023	1 1.5	25.26	7.68	1.929	2.18	0.98	-155.3	0.61	1.253	"	
1025	1.5 1.7	25.21	7.68	1.928	2.66	0.98	-156.5	0.44	1.254	"	
1027	2 1.9	25.19	7.68	1.930	1.88	0.98	-155.9	0.40	1.254	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-20110419 Time Collected: 1027 Comments: VOCT, BA, VFA, Br & F, TOC, Sulfide, MEE, Anion, Alk, Dissolved Metals, Dnc, vcrA
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal

Monitoring Well Sampling

Site: L034 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): IW000201 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1517 Time @ End of Purging: _____ Total Purging Time: _____ Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 632 ft. BTDL Total Well Depth: 65 ft. BLS Reference: TOL Well diameter: 2 in. Volume in well: 9 gal.
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 50-55 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1517	Start	<u>began purge</u>								<u>clear</u>	
1520	0.5	25.22	7.83	1.954	9.00	0.99	-117.5	0.77	1.272		
1525	1	25.21	7.83	1.958	8.41	0.99	-117.9	0.74	1.275		
1530	1.5	25.16	7.83	1.963	6.92	0.99	-118.5	0.40	1.277		
1535	2	25.16	7.83	1.967	6.79	1.00	-118.7	0.39	1.279		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-IW000201 Time Collected: 1535 Comments: VOL + nBA, VFA, Br & I, TOL, Sulfide, Mn, Arsenic,
 When using 3/4 6-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal All, Dissolved Metals

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer
 Station (Well ID): BWOOD1E Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Gespump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Sotrust
 Time @ Start of Purging: 1200 Time @ End of Purging: 1220 Total Purging Time: 20min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 5.68 Total Well Depth: 54 Reference: TOC Well diameter: 3/4 in. Volume in well: 1.08 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 51-54

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1200</u>	<u>Start</u>				<u>began purge</u>						
<u>1205</u>	<u>0.5</u>	<u>24.76</u>	<u>7.69</u>	<u>2.370</u>	<u>21.7</u>	<u>1.22</u>	<u>-153.7</u>	<u>0.33</u>	<u>1.540</u>	<u>clear</u>	
<u>1210</u>	<u>1</u>	<u>24.78</u>	<u>7.69</u>	<u>2.371</u>	<u>15.4</u>	<u>1.22</u>	<u>-153.7</u>	<u>0.35</u>	<u>1.541</u>	<u>↓</u>	
<u>1215</u>	<u>1.5</u>	<u>24.77</u>	<u>7.69</u>	<u>2.371</u>	<u>11.6</u>	<u>1.22</u>	<u>-153.7</u>	<u>0.37</u>	<u>1.542</u>		
<u>1220</u>	<u>2</u>	<u>24.74</u>	<u>7.69</u>	<u>2.372</u>	<u>12.0</u>	<u>1.22</u>	<u>-153.6</u>	<u>0.33</u>	<u>1.541</u>		
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BWOOD1E-052.5-20110418 Time Collected: 1220 Comments: Dhc/VOC A/VOCs/VFAs/MEE/TOC/Sulfide/Br?I
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)=0.34 gal
60 0.25 Soluble Metals/ANIONS/AIK

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer ewg
 Station (Well ID): BW0001F Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1130 Time @ End of Purging: 1150 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 59.5 ft. (BTOC) 59.5
 Water Level: 5.66 Total Well Depth: 61 Reference: TOC Well diameter: 3/4 in. Volume in well: 1.22 gal
 Screen: 58-61 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1130	Start	<u>begin</u>		<u>purge</u>	<u>clear</u>						
1135	0.5	25.08	7.73	2.280	23.8	1.17	-123.7	1.11	1.499	clear	
1140	1	24.89	7.66	2.474	4.91	1.27	-120.3	0.54	1.607	↓	
1145	1.5	24.95	7.66	2.471	3.89	1.27	-119.9	0.51	1.606	↓	
1150	2	24.96	7.65	2.471	3.86	1.27	-119.4	0.49	1.607		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001F-059.5- Time Collected: 1150 Comments: VOI/VFA/MBE/TOC/Br/I/Sulfide/Anions/Soluble Metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = 0.34 gal
61 0.25 Alkalinity

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Barber
 Station (Well ID): BW002E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1335 Time @ End of Purging: 1350 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 48.5 ²⁸ ~~53.5~~ ft. (BTOC)
 Water Level: 6.11 ft. Total Well Depth: 54 ~~47~~ ⁵⁴ ft. Reference: TOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)

BTOC Screen: 44-47 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1335	Start	25.33	7.75	2.038	18.7	1.04	-235.4	0.59	1.309	cloudy	
1340	0.5	25.35	7.65	2.063	18.4	1.05	-201.4	0.14	1.242	clear	
1345	1	25.34	7.67	2.063	18.7	1.05	-193.1	0.10	1.341	4	
1350	1.5	25.31	7.66	2.064	18.7	1.05	-186.7	0.08	1.341	11	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW002E-015-20110914 Time Collected: 1350 Comments: VOCs, VFAS, B/I, TOC, MEEs
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow tru vol) = gal
 $V_{well} = 0.210026 \times 57 \times 0.25 = 0.40 \text{ gal}$

Monitoring Well Sampling

Site: L034 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Berth
 Station (Well ID): BW0002F Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other X) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1430 Time @ End of Purging: 1445 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 59.5 ft. (BTOC)
 Water Level: 4.72 ft Total Well Depth: 61 ft - BLS Reference: TOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 BTOC screen: 58-61

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1430	Start	25.37	7.68	2.142	34.7	1.09	-161.0	0.47	1.393	clear	
1435	0.5	25.22	7.67	2.140	6.53	1.10	-158.4	0.23	1.396	"	
1440	1	25.19	7.64	2.143	3.23	1.09	-155.3	0.16	1.394	"	
1445	1.5	25.20	7.63	2.142	2.16	1.09	-154.6	0.16	1.397	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-BW0002F-059.5-20110419 Time Collected: 1445 Comments: VOCs, VFAs, B/T, TOC, M.E.E.S
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
0.45 gal
FP-20110419-13 (VOCs)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Burdett
 Station (Well ID): BW0003E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Reliant
 Time @ Start of Purging: 1352 Time @ End of Purging: 1406 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 10.29 ft. BTOC Total Well Depth: 54 ft. BLS Reference: TOL Well diameter: 3/4 in. Volume in well: 52.5 1.4 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1352	Start 0	<u>begin purge</u>								<u>cloudy</u>	
1402	0.5 1.0	<u>24.60</u>	<u>7.62</u>	<u>1.861</u>	<u>134</u>	<u>0.44</u>	<u>-156.1</u>	<u>0.31</u>	<u>1.210</u>	<u>clear</u>	
1404	1 1.2	<u>24.58</u>	<u>7.60</u>	<u>1.865</u>	<u>8.76</u>	<u>0.45</u>	<u>-156.1</u>	<u>0.28</u>	<u>1.212</u>	<u>4</u>	
1406	1.5 1.4	<u>24.56</u>	<u>7.59</u>	<u>1.870</u>	<u>6.03</u>	<u>0.45</u>	<u>-157.8</u>	<u>0.25</u>	<u>1.216</u>	<u>2</u>	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20110419 Time Collected: 1406 Comments: VOL+4BA, VFA, Br 1/2, TOL, M2E, DHI, VERA
 When using 3/4-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow thru vol)= gal

$$V.W. \rightarrow (0.035 \times 64 + 0.25) \times 3 = 1.2 \text{ gal}$$

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/19/11 Sampled By: J. Bartlett
 Station (Well ID): BW0003 F Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1505 Time @ End of Purging: 1519 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 59.5 ft. (BTOC)
 Water Level: 6.15 ft. BTOC Total Well Depth: 61 ft. BLS Reference: TUC Well diameter: 3/4 in. Volume in well: 1.2 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 58-61 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1505	Start 0	begin para								cloudy	
1515	0.5 1.0	24.60	7.56	2.003	4.43	1.02	-133.1	0.25	1.302	clear	
1517	1 1.2	24.61	7.56	2.003	2.33	1.02	-133.5	0.23	1.302	4	
1519	1.5 1.4	24.56	7.56	2.005	2.16	1.02	-132.5	0.22	1.304	4	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW00030-059.5-20110419 1519
 Sample ID: _____ Time Collected: _____ Comments: VOCK, BA, JFA, Brk J, TUC, MEE
 When using 3/4 6-in. ID tubing EV= ((0.041) (0.035x tubing length))+0.5(flow tru vol)= _____ gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: Emily Guyer
 Station (Well ID): IW0076 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): 6espump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1415 Time @ End of Purging: 1435 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 75 ft. (BTOC)
 Water Level: 6.22 Total Well Depth: 80 Reference: TOC Well diameter: 2 in. Volume in well: 13.04 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 70-80

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1415	Start				began purge						
1420	0.5	25.22	7.80	2.358	10.2	1.21	-182.8	0.23	1.536	clear	
1425	1	25.19	7.83	2.370	9.53	1.22	-183.6	0.23	1.542	↓	
1430	1.5	25.23	7.84	2.376	8.25	1.22	-183.5	0.22	1.546		
1435	2	25.22	7.83	2.381	7.92	1.22	-182.3	0.22	1.549		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0076-075.0- Time Collected: 1435 Comments: VOCs / NFA's / MEE / TOC / Sulfide / Amides / B-I / Alk / Soluble Metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow rate vol) = 0.36 gal
80 0.25

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Berthelt
 Station (Well ID): IW00670 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1113 Time @ End of Purging: 1132 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)
 Water Level: 6.31 ft. BTOC Total Well Depth: 43 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.86 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 38-43 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1113	Start 0	begin purge								cloudy	
1123	0.5 1.0	25.89	7.90	1.939	57.0	0.98	-252.7	0.38	1.261	"	
1128	1 1.5	25.87	7.92	1.941	12.3	0.98	-264.9	0.36	1.261	clear	
1130	1.5 1.7	25.85	7.91	1.939	6.78	0.98	-267.6	0.35	1.260	"	
1132	2 1.9	25.81	7.89	1.940	5.38	0.98	-271.9	0.35	1.260	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW00670-040.5-20110418 Time Collected: 1132 Comments: VOC + nBA, TOC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal
 (0.041 x 0.035 x 53 + 0.25) x 3 = 1.0 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): JW006701 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1145 Time @ End of Purging: 1219 Total Purging Time: 34 min Depth of Pump or Intake Tubing: 68.0 ft. (BTOC)
 Water Level: 5.01 ft. BTOC Total Well Depth: 73 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 1.5 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 63-73 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1145	Start 0	25.74	7.77	1.963	19.4	1.00	-156.5	0.78	1.276	cloudy	
1200	0.5 1.5	25.74	7.77	1.963	64.4	1.00	-158.5	0.39	1.276	"	
1205	1 2.0	25.95	7.78	1.963	35.6	0.99	-158.1	0.37	1.275	clear	
1210	1.5 2.5	25.84	7.79	1.961	19.7	0.99	-158.2	0.38	1.273	"	
1215	2 3.0	25.70	7.77	1.958	18.7	0.99	-155.9	0.37	1.273	"	
1217	2.5 3.2	25.83	7.77	1.959	17.2	0.99	-153.5	0.38	1.275	"	
1219	3 3.4	25.88	7.76	1.961							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-JW006701-068.0-20110418
 Sample ID: _____ Time Collected: 1219 Comments: VOC + nBA, TOC
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal
 (0.041 x 0.035 x 83 + 0.25) x 3 = 1.1 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): FW0070^{D 33} Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Soflo 65T
 Time @ Start of Purging: 1007 Time @ End of Purging: 1021 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)
 Water Level: 5.51 5.75 5.9 ft. BTOC Total Well Depth: 49 48 49 ft. BTOC Reference: TOC Well diameter: 3/4 in. Volume in well: 20.22 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 38-45

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1007	Start 0	begin purge								cloudy	
1017	0.5	25.28	7.78	1.862	12.5	0.94	-220.8	0.46	1.215	clear	
1019	1.2	25.32	7.83	1.837	7.43	0.96	-230.0	0.45	1.228	"	
1021	1.5	25.28	7.83	1.902	5.99	0.96	-220.0	0.43	1.237	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-FW00700-040.5-20110418 Time Collected: 1021 Comments: VOL + nBA, TOC
 When using 3/4 in. ID tubing EV = ((0.041) (0.035 x tubing length)) + 0.5 (flow thru vol) = gal
 0.041 x 0.035 x 53 + 0.25 = 0.32 x 3 = 1.0 gal

Monitoring Well Sampling

Site: L034 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartlett
 Station (Well ID): IW007001 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1032 Time @ End of Purging: 1056 Total Purging Time: 24 min Depth of Pump or Intake Tubing: 700 ft. (BTOC)
 Water Level: 4.95 ft. BTOC Total Well Depth: 75 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 1.5 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 05-75 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1032	Start 0	begin	purge							cloudy	
1042	0.5 1.0	25.55	7.88	1.965	101	1.00	-160.1	0.68	1.278	"	
1047	1 1.5	25.35	7.81	1.992	42.8	1.01	-152.5	0.51	1.295	"	
1052	1.5 2.0	25.68	7.81	2.008	16.8	1.02	-133.7	0.51	1.305	clear	
1054	2 2.2	25.79	7.77	2.011	16.2	1.02	-128.7	0.48	1.309	"	
1056	2.5 2.4	25.65	7.80	2.018	13.7	1.03	-122.5	0.47	1.312	"	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-IW007001-070.0-20110418 Time Collected: 1056 Comments: VOC + nPBA, TOC
 When using 3/4 in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
10.04 (10.035 x 85 + 0.25) x 3 = 1.1 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Berakht
 Station (Well ID): JW0071D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): 602 pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1342 Time @ End of Purging: 1356 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 40.5 ft. (BTOC)
 Water Level: 3.02 ft. BTOC Total Well Depth: 43 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.9 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 38-43 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1342	Start 0	begin purge								clear	
1352	0.5 1.0	24.57	7.87	1.832	1.76	0.93	-171.1	0.95	1.192	"	
1354	1 1.2	24.64	7.94	1.836	0.99	0.93	-175.6	0.95	1.194	"	
1356	1.5 1.4	24.67	7.91	1.837	0.69	0.93	-172.0	0.68	1.197	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34 - JW0071D - 040.5 - 20110418 Time Collected: 1356 Comments: VOC + nBA, TOC
 When using 3/4-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5(flow thru vol) = gal
 (0.041 x 0.035 x 53 + 0.25) x 30 = 1.0 gal

Monitor Well Sampling

Site: LC34 Project No.: TR0272 Task: 35 Date: 4/18/11 Sampled By: J. Bartelt
 Station (Well ID): IW007101 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1409 Time @ End of Purging: 1423 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 70.0 ft. (BTOC)
 Water Level: 3.23 ft. BTOC Total Well Depth: 75 ft. BUS Reference: TOC Well diameter: 3/4 in. Volume in well: 15 gal
 Correction Factors: (2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 65-75 ft. BUS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1409	Start 0	begin purge								cloudy	
1419	0.5 1.0	24.91	7.87	1.887	19.8	0.96	-124.3	0.38	1.230	clear	
1421	1 1.2	24.92	7.95	1.909	13.0	0.97	-128.1	0.37	1.242	"	
1423	1.5 1.4	24.95	7.82	1.920	7.59	0.97	-124.4	0.34	1.249	"	
	2										
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

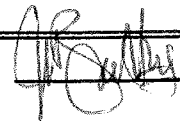
Sample ID: LC34-IW007101-070.0-20110418 Time Collected: 1423 Comments: VOL + MSA, TOC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + 0.5 (flow thru vol) = gal
 ((0.041) (0.035 x 95 + 0.25)) x 3 = 1.1 gal

Project: <u>W39 P10</u>	Date: <u>6/20/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>35</u>
Contractors: <u>EDS, Vironex</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0630: at office (Rebecca Soprano, Joe Bartlett) load truck. Travel to site. Meet. EDS
0730: Meet EDS and Vironex at NASA Badging station. Badging info not submitted. Rebecca Soprano contacts NASA PM to submit appropriate paperwork.
1000: on site tailgate safety meeting. Vironex and EDS prep/work to location. RB and JS mark location point locations. Call county office. ok to dig
1045: EDS begin drilling at 1st location
1055: calibrate MiniRAE 3000 SF: 10000 542-000855 0 ul = 0 ppm 100 ul = 98.6 ppm
1210: Vironex tailgate safety meeting. Vironex perform leak test w/ fresh water
1245-115: lunch.
6gpm = 15 psi , 12gpm = 38 psi

Plans/Future Activities

 6/22/11
Signature/Date

Project: LC34 RD Date: 6/20/11
Project No.: TR0272 Task No.: 36
Contractors: EPS, Vraney

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern

1405: begin injection at IP0001. 25 23-25 ft
1445: begin injection at IP0002.
1720: complete injection at IP0001 and IP0002 to 42 ft. BIS. (challenges)
1730: off site.
1800: end of day

Plans/Future Activities

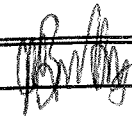
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Signature/Date

Project: <u>LC39</u>	Date: <u>6/21/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>EOS, Vinnex</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0630: met at office (Joe Bartlett and Rebecca Ruppato) Local vehicles. Travel to site
0705: on-site. call LCAPS duty office. OK to dig.
0715: Fairgate Safety meeting.
0730: Calibrate MiniRAE 3000 SN = 592-000859 0 Cal. = 0.0 ppm 100 Cal. = 104.1 ppm
0755: continue injection on 1P0001 and 1P0002. Begin at 42-44 ft. BIS. * skipped interval 41.5 - 42 in order to inject completely in clay layer
0825: Sampled Batch 10 (mixed at 0810) → BATCH 10 - 20110620 - 0825 [no iodide]
0955: end injection for locations 1P0001 and 1P0002. EOS terminate grant both locations from 62 ft BIS to surface.
1115: Begin injection 1P0003 and 1P0004 at 23-25 ft. BIS
1127: Sampled Batch 17 (mixed at 1120) [with iodide] → BATCH 17 - 20110621 - 1127

Plans/Future Activities

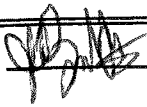
 6/21/11
Signature/Date

Project: <u>L139 PCU</u>	Date: <u>6/21/11</u>
Project No.: <u>TRO272</u>	Task No.: <u>36</u>
Contractors: <u>EDS, Wamy</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern
1215 - 1245: Lunch IDLW: 183863 , pallet: 183815
1400: 1 1/2" suction hose to injection truck leaking. PTO (used to engage power for hydraulic pump) broke down. Virconex attempt to fix.
1500: Virconex fixed PTO. New hose being pushed up by Virconex. Continue injection.
1555: Complete injection 1P0003 and 1P0004 to 42 ft. BIS - Continue tomorrow Begin to begin Begin injection at 1P0005 (6 ft. concen). First interval at 23 - 28 ft. BIS.
1725: Sampled Batch 26 (mixed at 1710) [with iodide] → BATCH 26 - 20110621 - 1725
1800: End injection at 1P0005 to 42 ft. BIS.
1850: off site.
1915: at office, unlaced vehicles.
1930: end of day

Plans/Future Activities

 6/21/11
 Signature/Date

Project: <u>LC39 P90</u>	Date: <u>6/22/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>38</u>
Contractors: <u>905, Virvex</u>	

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern

Jim Bertlett

0645: on site. Call daily office. OK to dig. Call Rebecca Dapunta (PM) for morning check-in.

0705: Teriyaki Safety Meeting.

0710: Calibrate MiniRAE 3000 SN: 592-000859
 0 Cal: 0.0 ppm
 100 Cal: 99.9 ppm

0745: Sampled Batch 29 (mixed at 0730)
 → BATCH 29 - 20110622 - 0745 [no iodide]

Continue injection of 1P0003, 1P0004, 1P0005. ~~First to be used~~ JB

~~1P0005~~ 42 ft. BLS.

1150: Sampled Batch 39 (mixed at 1150)
 → BATCH 39 - 20110622 - 1150 [no iodide]

1200: Complete injection of 1P0003, 1P0004, 1P0005.
 Virvex repair suction hose to allow two 250 gal. total to be used

1215-1230: Lunch

1230: pull out of and govt 1P0003, 1P0004, 1P0005

Plans/Future Activities

 6/22/11
 Signature/Date

Project: <u>U34 Prod</u>	Date: <u>6/24/11</u>
Project No.: <u>7R0272</u>	Task No.: <u>35</u>
Contractors: <u>205, Virman</u>	

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern

1405: ENS complete grouting 1P0003, 1P0004, 1P0005. Nuis to 1P0006, 1P0007, 1P0008 ^{(41m) (5) (6) (7)}

1430: Begin injection 1P0006, 1P0007, 1P0008

1458: Sampled Batch 40 (mixed at 1440) [with iodide]
 → BATCH 40 - 20110622-1458

1655: Sampled Batch 49 (mixed at 1655) [with iodide]
 → BATCH 49 - 20110622-1655

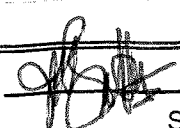
1720: End injection at 1P0006, 1P0007, 1P0008 to 42 ft. BIS.
 Virman repair/check for leaks in piping.

1735: off site. Call Rebecca Appato for end of day check-in

1800: at office. load vehicle for tomorrow

1815: end of day.

Plans/Future Activities

 6/24/11
 Signature/Date

Project: <u>LE34 PEN</u>	Date: <u>6/23/11</u>
Project No.: <u>TR272</u>	Task No.: <u>35</u>
Contractors: <u>EOS, Vironex</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern	
0645: <u>Joe Bartlett</u> on site. Call Duty Office. OK to dig.	
0700: Tailgate Safety Meeting.	
Calibrate MiniRAE 3000	SN = 392-000859
	0 Cal: 0.0 ppm
	100 Cal: 99.9 ppm
0715: Call Rebecca Soprano (PM) for morning check-in.	
0720: EOS cleared location to mass pt. g. 26 ft. NE.	
0735: Begin injection at 1P0006, 1P0007, 1P0008 at 44, 44, 47 ft. Bis.	
0750: Sampled Batch 54 (pumped at 0750)	
	→ BATCH 54 - 2000623 - 0750 [no iodide]
0835: Vironex Generator shut down. Stop pumping.	
1010: Vironex left site to rent a generator for duration of injection event.	
1130: Vironex returned with generator.	
1145: Continue injection at 1P0006, 1P0007, 1P0008.	

Plans/Future Activities

[Signature] 6/23/11
Signature/Date

Project: <u>LC34 P20</u>	Date: <u>6/23/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>38</u>
Contractors: <u>EDS, Viomec</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
1155: Sampled Batch 57 (Pumped at 1150) → BATCH 57 - 20110623 - 1150 [no iodide]
1320: End injection for 1P0006, 1P0007, 1P0008 to 62 ft BLS. EDS pulled tools and tremmie grout to surface in locations 1P0006, 1P0007, 1P0008.
1500: Begin injection on 1P0009, 1P0009, 1P0010 at 23-25 ft BLS
1540: Sampled Batch 67 (Pumped at 1540) → BATCH 67 - 20110623 - 1540 [with iodide]
1730: End injection of 1P0009, 1P0010, 1P0011 to 42 ft BLS. Call Rebecca Depinto for end of day check-in. Viomec clean up site. Ready equipment for tomorrow.
1800: off site.
1820: at office load vehicle
1830: end of day

Plans/Future Activities
K = 5 e = 11
M = 6
N = 7
O = 8
P = 9
R = 10

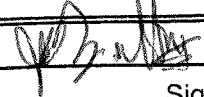
 6/23/11
Signature/Date

Project: <u>434 P20</u>	Date: <u>6/24/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>35</u>
Contractors: <u>EPS, Vironix</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection</u>	Sampling Drums: _____

Observations/Issues of Concern
0650 - on site. Call Duty office OK to dg-
0705: Tailgate Safety Meeting
0710: Text Rebecca Dapretto (PM) for morning check-in.
0715: Calibrate UniRA2 3000 SN: 592-000859
- will not use PID for remainder of event shift ! - Could not calibrate. Lamp needs replacement.
0720: Begin injection at 1P0009, 1P0010, 1P0011 at 42-44 ft BLS.
0920: End injection at 1P0009, 1P0010, 1P0011 to 62 ft BLS.
EDS pull tools out and grout locations.
1110 - Begin injection at 1P0012, 1P0013, 1P0014 at 23-25 ft BLS.
1145 - 1205: Lunch
1350: S Suction line broke inside Vironix truck. Sprayed laptop with liquid. Shut down pumping.
1440: Resume pumping. Vironix tied harness around suction line to relieve stress at connections (where break occurred).

Plans/Future Activities	
a = 12	* TRS Customer Service 1-800-621-6354
b = 13	
c = 14	

 6/24/11
Signature/Date

Project: LC39 P&D Date: 6/24/11
Project No.: TR0272 Task No.: 35
Contractors: EOS, Vironix

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X Injection.</u>	Sampling Drums: _____

Observations/Issues of Concern

1530: Called NASA Weather: Phase 2 for duration of day.
Shut down work. Clean up site
At 56 ft BLS, partially injected

1625: Called NASA weather, still in phase 2.

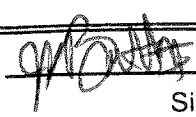
1635: @ PP site.

1700: at office to ready equipment for monday (6/26/11)

1715: end of day

Plans/Future Activities

next = h, i, l
next = j, c, d

 6/24/11
Signature/Date

Project: <u>LC 34 P20</u>	Date: <u>6/27/11</u>
Project No.: <u>700272</u>	Task No.: <u>36</u>
Contractors: <u>EOS, Vironix</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X injection</u>	Sampling Drums: _____

Observations/Issues of Concern	
0630:	Joe Bartlett at office - load vehicle. Travel to site.
0655:	On site - call Duty Office. Ok to dig.
0700:	Tailgate Safety Meeting - Text Rebecca Dapahn (PM) for morning check-in.
0715:	Continue injecting. 1P0012, 1P0013, 1P0014. 54-56 ft. BIS.
0800:	Complete injection for 1P0012 (to 61 ft. BIS, refusal from DPT rig at 61 ft.), 1P0013 (62 ft. BIS), 1P0014 (62 ft. BIS). EOS pull tools out of ground, tremmie grout to surface.
0955:	Begin injection at 1P0015, 1P0016, 1P0017 at 23.25 ft. BIS.
1000:	Sampled Batch 112 (pumped at 0955) → BATCH 112 - 20110627 @ 1000 [with iodide]
1110:	Sampled Batch 117 (pumped at 1058) → BATCH 117 - 20110627 @ 1110 [with iodide]
1200-1230:	Lunch
1315:	Sampled Batch 127 (pumped at 1315) → BATCH 127 - 20110627 @ 1315 [no iodide]

Plans/Future Activities	
h = 15	
i = 16	
j = 17	

 6/27/11
Signature/Date

Project: <u>634 P&D</u>	Date: <u>6/27/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>EAS, Vinnep</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>x injection</u>	Sampling Drums: _____

Observations/Issues of Concern
1450: Sampled Batch 134 (pumped at 1450) → BATCH 134 - 20UB627 @ 1450 [no iodide]
1500: End injection for 1P0015, 1P0016, 1P0017 to 62 ft BLS. EAS pull tools out and trampoline grout to surface location 1P0016 only.
1540: EAS complete grout for 1P0016. Called NASA Weather: Phase 2 for remainder of day. Text Rebecca Dupato (PM) for evening check-in.
1545: Off site.
1615: at office. load vehicle for tomorrow. discuss GW sampling plans w/ Rebecca Dupato.
end of day
1700: end of day.

Plans/Future Activities
grout 1P0015, 1P0017 Project 18, 19, 20.

 6/27/11
Signature/Date

Project: <u>UCBY PEO</u>	Date: <u>6/28/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>EDS, Virox</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: <u>X injection</u>	Sampling Drums: _____

Observations/Issues of Concern

0630: at Joe Bartlett at office. load vehicle. Travel to site.

0700: on site. Call party office OK to dig.
 Meet Rebecca Depiate (PM) for morning check-in
 Target Safety Meeting.

0715: EDS continue to pull out tools from ground and tremmie
 grout to surface locations 1P0015, 1P0017.

0800: Sampled Batch 136 (pumped at 0855)
 → BATCH 136 - 20110628 [with iodide] @ 0900

Begin injection at 1P0018, 1P0019, 1P0020 at 23-25 ft BLS

1040: Sampled Batch 144 (pumped at 1036)
 → BATCH 144 - 20110628 @ 1040 [with iodide].

1115-1130: Lunch

1237: Sampled Batch 152 (pumped at 1232)
 → BATCH 152 - 20110628 @ 1237 [no iodide].

1340: End injection at 1P0018, 1P0019, 1P0020. to 62 ft. BLS
 EDS pull all tools out of ground. tremmie grout to surface.

Virox Local Equipment Plans/Future Activities

d: 18
 c: 19
 j: 20


 6/28/11
 Signature/Date

Project: L134-PCD
Project No.: PRO272
Contractors: EOS, Viromex
Date: 6/28/11
Task No.: 30

Work Performed

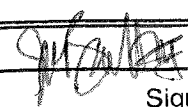
Well Installation: _____
Soil Borings: _____
DPT: _____
Well Inventory: _____
Other: X injection

Sampling Soil: _____
Sampling SW/Sediment: _____
Sampling Monitor Wells: _____
Sampling Hazardous Waste: _____
Sampling Drums: _____

Observations/Issues of Concern

1545: Viromex complete pack up & off site.
1600: EOS clean up site. Build down pit for GW sampling on Tue. (6/30/11)
1615: Off site. Call Rebecca Depinto (PM) for evening check-in.
1700: end of day

Plans/Future Activities

 6/28/11
Signature/Date

Project: <u>LC39 P20</u>	Date: <u>6/30/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>EDS, KBlabs</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: <u>X GW Sampling</u>	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0600: Joe Bartlett at office. Load vehicle. Travel to site
0645: On site. Calibrate VSI.
EDS on site. KBlabs on site
0710: Tailgate Safety Meeting
Call Party Office. OK to dig.
Text ^{Call} Rebecca Paperto for morning check-in
0720: EDS Mob to location DPT328. Hand auger to 5 ft BLS. Begin sampling DPT328.
0855: EDS complete sampling DPT328. Pull tools out. Tremmie grout to surface.
0915: EDS Mob to DPT329. Hand auger to 5 ft BLS. Begin sampling DPT329.
0935: EDS down 6 samplers.
1030: Complete sampling location DPT329. Pull tools out - Tremmie grout to surface.
1100: EDS Mob to DPT330. Hand auger to 5 ft BLS. Begin sampling DPT330.

Plans/Future Activities

CPB 6/30/11
Signature/Date

Project: <u>LC34 P&O</u>	Date: <u>6/30/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>EAS, KBlabs</u>	

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: <u>X GW sampling</u>	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern

1200-1230: lunch

1305: Complete sampling DPT 330. Pull out tools. Tremmie ground to surface

1330: EAS Mob. to DPT 331. Hand auger to 5 ft. BLS. Begin sampling.

1440: Call NASA Weather. Phase 2 in 20 minutes.

Complete sampling DPT 331 at 43-47 ft. BLS. Pull out tools.

Tremmie ground to surface.

pack up/clean up site. Phase 2 will last rest of day.

1510: Take 10W sample.

LC34-10W-183863-20110630 @ 1510

1530: Call NASA Weather for update. Phase 2 is arriving on CCAPS side

1600: off site

Plans/Future Activities

 6/30/11
 Signature/Date

**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: 634 P20 Project #: TR0272 Field Personnel: J. Bartlett

Turbidimeter - Model/Serial # NA

Water Quality Meter - Model/Serial #: YS1556MPS / 08A100738

DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L)'	Reading (mg/L)	Reading (%)	Pass or Fail
<u>Dissolved Oxygen</u>							
CAL ICV CCV	6/20/11	06:45	23.20	8.546	7.70/8.55	90.1 / 100.0	P
CAL ICV CCV	"	16:38	23.60	6.482	4.99	11.8	F
CAL ICV CCV	"	"	"	"	"	"	P
CAL ICV CCV	"	"	"	"	"	"	P

DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<u>Specific Conductance</u>							
CAL ICV CCV	6/20/11	06:58	1.413	8705	02-2012	1.461 / 1.413	P
CAL ICV CCV	"	17:02	"	"	"	1.445	P
CAL ICV CCV	"	"	"	"	"	"	P
CAL ICV CCV	"	"	"	"	"	"	P
CAL ICV CCV	"	"	"	"	"	"	P
CAL ICV CCV	"	"	"	"	"	"	P

DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<u>pH</u>							
CAL ICV CCV	6/20/11	06:50	4.0	2102011	01-2012	4.01	P
CAL ICV CCV	"	"	7.0	2101324	07-2012	6.00	F
CAL ICV CCV	"	"	7.0	2101037	12-2012	7.06	P
CAL ICV CCV	"	"	4.0	"	"	4.19	P
CAL ICV CCV	"	16:42	2.0	"	"	2.18	P
CAL ICV CCV	"	"	10.0	"	"	10.01	P

SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<u>ORP</u>							
CAL ICV CCV	6/20/11	07:00	240 @ 25	2181	01-2016	298.9 / 240	P
CAL ICV CCV	"	17:05	"	"	"	234.9	P
CAL ICV CCV	"	"	"	"	"	"	P
CAL ICV CCV	"	"	"	"	"	"	P

0.1 - 10 NTU Std ___ NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

11 - 40 NTU Std ___ NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

41 - 100 NTU Std ___ NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

>100 NTU Std ___ NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

Specific Conductance Probe Cleaned? Yes (No) Dissolved Oxygen membrane Changed? Yes (No)

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with a "J" qualifier

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: Failed DO CCV

DPT GEOCHEMICAL DATA FORM
 DPT Location: ~~NT 328~~ 328

Project Number: TR0272
 Date: 6/30/11

DPT Location	Sample Depth	pH std units	Conductivity μ S/cm	Turbidity NTUs	Diss. O ₂ mg/L	Temp deg. C	Salinity %	TDS g/L	ORP mV	color
0732	28-32	7.71	1.693	-	6.00	25.17	0.88	1.135	-166.1	grey
0734	↓	7.77	1.755	-	0.79	25.70	0.88	1.140	-181.3	
0736	↓	7.77	1.754	-	0.53	25.69	0.88	1.140	-183.6	
Sampled: LC34-DPT328-030.0-20110630 @ 0736										
0749	37-41	8.01	1.976	-	11.22	24.87	1.01	1.300	-179.8	grey
0751	↓	7.95	2.057	-	1.80	25.24	1.10	1.413	-194.4	
0753	↓	7.94	2.239	-	0.51	25.37	1.15	1.470	-199.2	
Sampled: LC34-DPT328-059.0-20110630 @ 0753										
0806	43-47	8.05	2.316	-	6.37	25.13	1.19	1.509	-170.8	brown
0808	↓	8.01	2.331	-	1.01	25.30	1.20	1.521	-184.5	
0810	↓	7.99	2.354	-	0.42	25.35	1.21	1.535	-184.5	
Sampled: LC34-DPT328-045.0-20110630 @ 0810										
0823	49-53	8.04	2.205	-	4.06	25.32	1.13	1.440	-185.1	tan
0825	↓	8.08	2.221	-	0.74	25.40	1.14	1.449	-198.7	
0827	↓	8.09	2.240	-	0.44	25.39	1.15	1.464	-204.5	
Sampled: LC34-DPT328-051.0-20110630 @ 0827										
0845	55-59	8.20	2.058	-	4.20	25.34	1.05	1.336	-128.1	grey
0847	↓	8.15	2.057	-	0.90	25.34	1.05	1.337	-144.9	
0849	↓	8.12	2.056	-	0.43	25.35	1.05	1.337	-147.2	
Sampled: LC34-DPT328-057.0-20110630 @ 0849										

Note: Insert units if not provided on sheet.

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YSI failed DO CCV.

DPT GEOCHEMICAL DATA FORM
 DPT Location: DPT329

Project Number: TR0272
 Date: 6/30/11

DPT Location	Sample Depth	pH std units	Conductivity μ S/cm	Turbidity NTUs	Diss. O ₂ mg/L	Temp deg. C	Salinity %	TDS g/L	ORP mV	color
0927	28-32	8.62	1.065	-	5.90	26.21	0.53	0.694	-164.3	grey
0929	↓	8.52	1.074	-	0.92	26.38	0.53	0.702	-192.5	
0931	↓	8.43	1.086	-	0.42	26.44	0.54	0.710	-207.8	
	Sampled:	LC34-DPT329-030.0-2011	0.30 @		0931					
0951	37-41	8.32	1.474	-	5.09	26.51	0.74	0.966	-127.3	grey
0953	↓	8.34	1.499	-	0.68	26.60	0.76	0.983	-151.0	
0955	↓	8.31	1.522	-	0.31	26.67	0.76	0.993	-159.7	
	Sampled:	LC34-DPT329-039.0-2011	0.30 @		0955					
1008	43-47	8.23	1.593	-	4.76	27.18	0.80	1.036	-60.0	brown
1010	↓	8.19	1.592	-	1.50	27.19	0.80	1.034	-71.7	
1012	↓	8.17	1.589	-	1.23	27.17	0.79	1.030	-91.4	
	Sampled:	LC34-DPT329-045.0-2011	0.30 @		1012					
1025	49-53	8.29	1.406	-	7.12	27.55	0.70	0.920	-123.2	grey
1027	↓	8.29	1.423	-	1.49	27.46	0.71	0.930	-157.1	
1029	↓	8.26	1.436	-	0.76	27.34	0.72	0.937	-173.9	
	Sampled:	LC34-DPT329-051.0-2011	0.30 @		1029					

Note: Insert units if not provided on sheet.
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YSI failed DO CCV

DPT GEOCHEMICAL DATA FORM
 DPT Location: DPT330

Project Number: JR0272
 Date: 6/30/11

DPT Location	Sample Depth	pH std units	Conductivity m S/cm	Turbidity NTUs	Diss. O ₂ mg/L	Temp deg. C	Salinity %	TDS g/L	ORP mV	color.
1115	B-12	8.35	0.597	-	2.72	29.31	0.29	0.395	-159.2	tan
1117	↓	8.14	0.608	-	0.56	29.14	0.29	0.394	-154.7	
1119	↓	7.96	0.606	-	0.34	29.01	0.29	0.394	-152.1	
Sampled: LC34-DPT330-010.0-20110630 @ 1119										
1128	28-32	7.96	1.427	-	4.28	29.49	0.73	0.955	-202.5	gray
1130	↓	8.03	1.495	-	0.92	28.90	0.75	0.986	-211.2	
1132	↓	8.03	1.526	-	0.58	28.43	0.77	0.998	-211.5	
Sampled: LC34-DPT330-030.0-20110630 @ 1132										
1143	87-41	8.10	2.195	-	7.48	29.64	1.12	1.433	-167.8	gray
1145	↓	8.07	2.211	-	0.83	29.76	1.12	1.441	-179.7	
1147	↓	8.06	2.277	-	0.34	29.47	1.17	1.496	-185.9	
Sampled: LC34-DPT330-039.0-20110630 @ 1147										
1240	43-47	8.19	1.916	-	0.66	29.95	0.96	1.241	-175.4	gray
1242	↓	8.14	1.905	-	0.24	29.52	0.96	1.238	-191.8	
1244	↓	8.12	1.904	-	0.20	28.94	0.96	1.235	-198.7	
Sampled: LC34-DPT330-045.0-20110630 @ 1244										
1258	49-53	8.20	2.134	-	6.05	29.49	1.10	1.416	-154.9	gray
1300	↓	8.13	2.207	-	0.95	29.01	1.13	1.448	-177.2	
1302	↓	8.09	2.237	-	0.47	28.63	1.14	1.457	-184.9	
Sampled: LC34-DPT330-051.0-20110630 @ 1302										

Note: Insert units if not provided on sheet.

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YSI failed 00 CCV

517-886-3387
~~XXXXXXXXXX~~

DPT GEOCHEMICAL DATA FORM
 DPT Location: DPT331

Project Number: TR0272
 Date: 6/30/11

DPT Location	Sample Depth	pH std units	Conductivity μ S/cm	Turbidity NTUs	Diss. O ₂ mg/L	Temp deg. C	Salinity %	TDS g/L	ORP mV	color
1344	14-18	8.32	0.884	-	5.25	28.00	0.42	0.557	-194.6	gray
1346	↓	8.03	0.849	-	0.97	27.50	0.41	0.545	-197.2	
1348	↓	7.88	0.829	-	0.50	27.11	0.40	0.535	-195.1	
	Sampled:	LC34-DPT331-016.0-20110630 @			1348					
1357	28-32	7.86	1.571	-	3.38	28.39	0.80	1.041	-188.5	gray
1359	↓	7.92	1.625	-	1.01	28.08	0.82	1.069	-198.0	
1401	↓	7.93	1.660	-	0.55	27.86	0.84	1.089	-204.7	
	Sampled:	LC34-DPT331-030.0-20110630 @			1401					
1412	37-41	7.86	2.410	-	3.48	28.79	1.24	1.581	-148.2	gray
1414	↓	7.78	2.437	-	0.55	28.58	1.25	1.592	-154.8	
1416	↓	7.74	2.478	-	0.33	28.22	1.31	1.660	-161.9	
	Sampled:	LC34-DPT331-039.0-20110630 @			1416					
1429	43-47	8.01	2.681	-	4.09	28.53	1.38	1.746	-104.9	tan
1431	↓	7.96	2.692	-	2.71	28.32	1.39	1.752	-126.5	
1433	↓	7.88	2.700	-	1.62	27.97	1.39	1.756	-141.9	
	Sampled:	LC34-DPT331-045.0-20110630 @			1433					
1445	53									
	↓									
	Sampled:	LC34-DPT331-051.0-20110630 @								

Note: Insert units if not provided on sheet.

J:\adminshrem-fm\DPTFRM.XLS

YSI Failed DO CCV

Project: <u>LC34</u>	Date: <u>7/7/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>36</u>
Contractors: <u>NA</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern	
0730	Pack Truck Get ice Travel to site get badge
0830	arrive at site Sample BW0001 C, D, E BW0002 C, D, E BW0003 C, D, E RW0007 & RW0008
1130	Travel back to office
1230	lunch
1330	Calibrate Equipment & unpack truck.

Plans/Future Activities	

E. J. Macdon
Signature/Date 7/7/11

**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: LC94 P&O Project #: TR0272 Field Personnel: J. Bartlett

Turbidimeter - Model/Serial # HAK42000 / 101106006392

Water Quality Meter - Model/Serial #: YS1556 MFS / 08A100738

Parameter	DEP SOP	Date	Time	Temp (°C)	Saturation (mg/L)	Reading (mg/L)	Reading (%)	Pass or Fail
Dissolved Oxygen	FT 1500	7/6/11	1605	26.02	8.119	8.49/10.11	101.6/100.0	P
	ICV CCV	7/6/11	1355	26.60	8.026	8.16	106.0	P
	CAL ICV CCV							P
	CAL ICV CCV							P
Specific Conductance	FT 1200	7/6/11	1420	14.13	0061813	06-2011	1285/1413	P
	ICV CCV	7/6/11	1427	"	"	"	1.453	P
	CAL ICV CCV							P
	CAL ICV CCV							P
pH	FT 1100	7/6/11	1610	4.0	2002034	01-2012	4.05/3.97	P
	ICV CCV	7/6/11	1422	7.0	2003010	01-2012	7.67/7.60	P
	CAL ICV CCV			10.0	1002035	07-2011	9.93/10.00	P
	CAL ICV CCV			"	"	"	4.00	P
ORP	SOP N/A	7/6/11	1605	140.025	2294	03-2015	236.7/240.0	P
	ICV CCV	7/6/11	1432	"	"	"	239.6	P
	CAL ICV CCV							P
	CAL ICV CCV							P

Parameter	DEP SOP	Date	Time	Temp (°C)	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Dissolved Oxygen	FT 1500	7/6/11	1605	26.02	8.119	8.49/10.11	101.6/100.0	P
	ICV CCV	7/6/11	1355	26.60	8.026	8.16	106.0	P
	CAL ICV CCV							P
	CAL ICV CCV							P
Specific Conductance	FT 1200	7/6/11	1420	14.13	0061813	06-2011	1285/1413	P
	ICV CCV	7/6/11	1427	"	"	"	1.453	P
	CAL ICV CCV							P
	CAL ICV CCV							P
pH	FT 1100	7/6/11	1610	4.0	2002034	01-2012	4.05/3.97	P
	ICV CCV	7/6/11	1422	7.0	2003010	01-2012	7.67/7.60	P
	CAL ICV CCV			10.0	1002035	07-2011	9.93/10.00	P
	CAL ICV CCV			"	"	"	4.00	P
ORP	SOP N/A	7/6/11	1605	140.025	2294	03-2015	236.7/240.0	P
	ICV CCV	7/6/11	1432	"	"	"	239.6	P
	CAL ICV CCV							P
	CAL ICV CCV							P

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments:



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TR0272 Field Personnel: Emily Lawson (eul) Turbidimeter - Model/Serial #: Hach 2100C SN 11020007557

Water Quality Meter - Model/Serial #: YSI 550 MPS/05D2373 AK

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L)	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		7/6/11	1610	24.5	8.310	6.25-8.37	72.6-100.1	P
CAL ICV CCV		7/7/11	1400	23.6	8.252	8.21	96.7	P
CAL ICV CCV								P
CAL ICV CCV								P

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		7/6/11	1610	1.413	0061813	6/30/11	1.100-1.413	P
CAL ICV CCV		7/7/11	1400	1.1	11	1.425		P
CAL ICV CCV								P
CAL ICV CCV								P
CAL ICV CCV								P
CAL ICV CCV								P

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		7/6/11	1610	4	2022034	01-2012	3.76-4.00	P
CAL ICV CCV				7	2022012	01-2012	7.03-7.00	P
CAL ICV CCV				10	1002035	07-2011	9.70-9.95	P
CAL ICV CCV		7/7/11	1400	Same as above			4.04	P
CAL ICV CCV							7.02	P
CAL ICV CCV							10.04	P

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		7/6/11	1610	240	2244	Geosyntec	226.8-202.0	P
CAL ICV CCV		7/7/11	1400	250	200513	03/2015	250.0	P
CAL ICV CCV								P
CAL ICV CCV								P

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	10	7/6/11	11.0	P
CAL ICV CCV	10	7/7/11	11.0	P
CAL ICV CCV				P
CAL ICV CCV				P

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	20	7/6/11	20.1	P
CAL ICV CCV	20	7/7/11	19.9	P
CAL ICV CCV				P
CAL ICV CCV				P
CAL ICV CCV				P
CAL ICV CCV				P

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	100	7/6/11	99.6	P
CAL ICV CCV	100	7/7/11	101	P
CAL ICV CCV				P
CAL ICV CCV				P
CAL ICV CCV				P
CAL ICV CCV				P

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	200	7/6/11	206	P
CAL ICV CCV	200	7/7/11	285	P
CAL ICV CCV				P
CAL ICV CCV				P

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

Comments: _____
 CAL - Initial Calibration
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Joe Bartlett
Erin Lawson JB
 Station (Well No.): BW0001C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
Hero Durham
 Time @ Start of Purging: 0842 Time @ End of Purging: 0900 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 9.21 ft. BTOC Total Well Depth: 40 38.5 ft. Reference: TOC Well diameter: 3/4" Condition of Well: good

Screen 37-40

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
0842	Start	<u>Bar</u>	<u>Purge</u>							<u>clear</u>	
0852	0.5 1.0	25.81	7.15	2.544	4.21	-121.9	0.32	1.31	1.658	"	
0855	1 1.3	25.91	7.16	2.574	1.93	-124.2	0.28	1.32	1.674	"	
0857	1.5 1.5	25.99	7.16	2.585	1.64	-125.0	0.26	1.33	1.681	"	
0859 0900	2 1.9	26.08	7.15	2.590	1.60	-125.4	0.23	1.33	1.684	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001C-038.5
20110707 Time Collected: 0900 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal
0 0.25 0.25 45 0.25 = 0.37 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Joe Bartlett
Emily Lawson JB
 Station (Well No.): BWOODID Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Hero Durham
 Time @ Start of Purging: 0915 Time @ End of Purging: 0932 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 45.45 ft. (BTOC)
 Water Level: 10.82 Total Well Depth: 47 Reference: TOC Well diameter: 2 1/4" Condition of Well: good
Screen 44-47

Time	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
0915	Start	25.11	7.41	2.961	65.4	-99.3	0.97	1.54	1.924	cloudy	
0922	0.5	25.66	7.41	2.961	65.4	-99.3	0.97	1.54	1.924	"	
0928	1	25.03	7.37	2.963	8.33	-98.7	0.32	1.54	1.926	clear	
0930	1.5	25.65	7.35	2.961	4.78	-99.9	0.27	1.54	1.924	"	
0932	2	25.62	7.33	2.960	4.74	-101.0	0.24	1.54	1.924	"	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BWOODID-045.5-20110707 Time Collected: 0932 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

0 + ((0.041)(0.25 x 0.25 x 50) + 0.25) = 0.38 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 36 Date: 7/7/11 Sampled By: Joe Bartlett
Emily Lawson JB
 Station (Well No.): BW0001E Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder
 Pump (Make & Model): geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Hero Durham
 Time @ Start of Purging: 0948 Time @ End of Purging: 1002 Total Purging Time: 14 min. Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 5.18 Total Well Depth: 54 Reference: TOC Well diameter: 1 3/4" Condition of Well: good
Screen 51-54

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
0948	Start	Begin Purge								clear	
0953	0.5	25.60	7.61	2.554	28.4	-127.1	0.36	1.31	1.661	11	
0958	1	25.58	7.60	2.567	8.22	-138.7	0.22	1.32	1.669	11	
1000	1.5 1.2	25.60	7.60	2.574	5.71	-141.6	0.19	1.32	1.673	11	
1002	2 1.4	25.55	7.60	2.578	3.88	-144.5	0.17	1.33	1.676	11	
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001E-0525-20110707 Time Collected: 1002 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal
0 0.25 0.25 55 0.15 = 0.39 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Emily Lawson

Station (Well No.): BW0002D Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder

Pump (Make & Model): geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556MPS Water Level Meter: Durham

Time @ Start of Purging: 1115 Time @ End of Purging: 1135 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)

Water Level: 6.43 Total Well Depth: 47 Reference: TOC Well diameter: 314 Condition of Well: good
and 3544-47

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
<u>1115</u>	<u>Start</u>						<u>began purge</u>			<u>clear</u>	
<u>1120</u>	<u>0.5</u>	<u>26.72</u>	<u>7.35</u>	<u>2.413</u>	<u>16.6</u>	<u>-151.9</u>	<u>0.24</u>	<u>1.24</u>	<u>1.571</u>	<u>clear</u>	
<u>1125</u>	<u>1</u>	<u>26.37</u>	<u>7.37</u>	<u>2.418</u>	<u>15.5</u>	<u>-156.7</u>	<u>0.22</u>	<u>1.24</u>	<u>1.572</u>		
<u>1130</u>	<u>1.5</u>	<u>26.40</u>	<u>7.38</u>	<u>2.419</u>	<u>13.1</u>	<u>-158.5</u>	<u>0.21</u>	<u>1.24</u>	<u>1.573</u>		
<u>1135</u>	<u>2</u>	<u>26.38</u>	<u>7.39</u>	<u>2.425</u>	<u>11.7</u>	<u>-161.0</u>	<u>0.20</u>	<u>1.24</u>	<u>1.577</u>		
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002D-045.5-
 Sample ID: 20110707 Time Collected: 1135 Comments: VOC B&I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

0 0.25 0.25 50 + 0.25 = 0.38 gal

Monitoring Well Sampling

Joe Bartlett

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Emily Lawson ~~JB~~

Station (Well No.): BWOODZ Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder Softest

Pump (Make & Model): geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Hero Durham

Time @ Start of Purging: 1053 Time @ End of Purging: 1110 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 43.5 52.5 f. (BTOC)

Water Level: 6.45 Total Well Depth: 45.5 54 Reference: TOC Well diameter: 1 3/4" Condition of Well: good

Time	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
1053	Start	Begin	Sampling							grey	
1058	0.5	26.32	7.81	2.559	305	-278.8	0.19	1.32	1.665	cloudy	
1103	1	26.00	7.80	2.570	106	-254.6	0.14	1.32	1.672	"	
1106	1.5	25.75	7.79	2.580	13.1	-233.3	0.13	1.33	1.678	clear	
1108	2	25.60	7.79	2.586	9.82	-234.9	0.12	1.33	1.681	"	
1110	2.5	25.55	7.77	2.584	5.57	-229.4	0.12	1.33	1.680	"	
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BWOODZ - 0425 052.5
 Sample ID: 20110707 Time Collected: 1110 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

0 + (0.041)(0.25 x 0.25 x 55) + 0.39 = 0.39 gal

Monito. ...g Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Emily Lawson
 Station (Well No.): BW0034D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder Solinst
 Pump (Make & Model): geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Hero Durham
 Time @ Start of Purging: 1000 Time @ End of Purging: 1020 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)
 Water Level: 5.27 Total Well Depth: 47 Reference: TOC Well diameter: 3.14 Condition of Well: good

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
1000 1000	Start				began purge / clear						
1005 1005	0.5	25.32	5.30	1.924	11.0	51.0	0.46	0.98	1.257	clear	
1010 1100	1	25.64	5.59	2.059	15.7	55.4	0.43	1.05	1.317	↓	
1015 1105	1.5	25.68	5.68	2.080	13.6	23.3	0.43	1.06	1.359		
1020 1115	2	25.70	5.74	2.123	13.1	13.2	0.42	1.11	1.413		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0034D-045.5-20110707 Time Collected: 1100 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

$$0 + ((0.041)(0.25 \times 0.25 \times 50) + 0.25) = 0.38 \text{ gal}$$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Emily Lawson ~~Joe Bartlett ml~~

Station (Well No.): BW0003E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder Solinst

Pump (Make & Model): geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Hero Durham

Time @ Start of Purging: 1025 Time @ End of Purging: 1035 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 5.68 Total Well Depth: 54 Reference: TOC Well diameter: 3/4 Condition of Well: good

51-54

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
1025	Start										
1030	0.5	24.90	6.87	1.996	10.8	-126.8	0.34	1.01	1.285	clear	
1035	1	25.00	6.92	1.980	12.0	-127.5	0.24	1.01	1.286	↓	
1040	1.5	25.02	6.93	1.977	8.96	-127.6	0.23	1.00	1.284		
1045	2	25.02	6.94	1.974	7.02	-127.9	0.22	1.00	1.281		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20110707 Time Collected: 1045 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

$$0 + ((0.041)(0.25 \times 0.25 \times 55) + 0.25) = 0.39 \text{ gal}$$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Joe Bartlett
Emily Lawson
 Station (Well No.): RW0007 Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Hero Durham
 Time @ Start of Purging: 0845 end Time @ End of Purging: 0905 end Total Purging Time: 20 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)
 Water Level: 6.32 Total Well Depth: 42 Reference: TOC Well diameter: 1.5 Condition of Well: good
35-42

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
0845 ⁰⁹¹⁰	Start										
0915	0.5	25.29	7.23	2.202	4.37	-117.6	0.40	1.12	1.431	clear	
0920	1	25.26	7.22	2.202	3.52	-122.4	0.31	1.12	1.431	↓	
0925	1.5	25.26	7.22	2.201	4.61	-123.2	0.28	1.12	1.431	↓	
0930	2.0	25.27	7.22	2.202	4.29	-123.9	0.27	1.12	1.431		
	2.5										
	3										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-0910-0930 Time Collected: 0910-0930 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

0 0.25 0.25 45 0.15 = 0.37 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 36 Date: 7/7/11 Sampled By: Joe Bartlett
Emily Lawson
 Station (Well No.): RW0008 Purge Method: Pump Bailer Pump Type: Submersible Teflon SS Other Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Hero Durham
 Time @ Start of Purging: 0845 Time @ End of Purging: 0905 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 52 ft. (BTOC)
 Water Level: 6.07 Total Well Depth: 60.57 Reference: TOC Well diameter: 6 Condition of Well: good
47-57

Time	Cumulative Purge Volume (gal)	Temp (°C)	PH	Conductivity (mS/cm)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Salinity (%)	TDS (g/L)	Color	Comments
<u>0845</u>	<u>Start</u>										
<u>0850</u>	<u>0.5</u>	<u>25.12</u>	<u>7.32</u>	<u>2.347</u>	<u>5.66</u>	<u>-195.5</u>	<u>0.63</u>	<u>1.20</u>	<u>1.526</u>	<u>clear</u>	
<u>0855</u>	<u>1</u>	<u>25.15</u>	<u>7.33</u>	<u>2.347</u>	<u>11.0</u>	<u>-203.2</u>	<u>0.56</u>	<u>1.20</u>	<u>1.525</u>	↓	
<u>0900</u>	<u>1.5</u>	<u>25.17</u>	<u>7.34</u>	<u>2.347</u>	<u>8.54</u>	<u>-206.9</u>	<u>0.38</u>	<u>1.20</u>	<u>1.525</u>		
<u>0905</u>	<u>2</u>	<u>25.18</u>	<u>7.35</u>	<u>2.347</u>	<u>8.67</u>	<u>-208.6</u>	<u>0.27</u>	<u>1.20</u>	<u>1.525</u>		
	<u>2.5</u>										
	<u>3</u>										

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-0520-20110707 Time Collected: 0905 Comments: VOCs Br I

EV = [pump vol (gal) + ((0.041)(tubing diameter x tubing diameter (in in.) x tubing length (in ft)) + flow thru vol (in gal))] = EV in gal

0 0.25 0.25 60 0.25 = 0.40 gal

Project: <u>LC34</u>	Date: <u>08/01/11</u>
Project No.: <u>TR0272</u>	Task No.: <u>37</u>
Contractors: <u>-</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>X</u> <u>GW</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
<p>0740: Joe Bartlett and Dave Sizemore at office. Calibrate VSI and turbidimeter (ICV). Load vehicles. Travel to site.</p> <p>0800: On site. Meet Rebecca Depina (Geosyntec PM) for morning check-in. Begin sampling. For details, refer to attached 'Monitoring Well Sampling' forms.</p> <p>1215-1230: Lunch</p> <p>1540: Off site. Call Rebecca Depina for end-of-day check-in.</p> <p>1830: at office. Pack samples for shipping.</p> <p>1730: end of day.</p>

Plans/Future Activities


[Signature] 08/01/11
Signature/Date

Project: <u>1034</u>	Date: <u>08/02/11</u>
Project No.: <u>TR0292</u>	Task No.: <u>37</u>
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>x (6w)</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
<p>0730: Joe Bartlett and Dave Steemans at office. Calibrate YSI and turbidimeter (CCV, ICV) - load vehicle. Travel to site. Text Rebecca Deparis XXXXXXXXXX (Geosyntec PM) for morning check-in.</p> <p>0900: on site. Begin sampling. For details, refer to attached monitoring well sampling forms.</p> <p>1215-1230: Lunch.</p> <p>1415: End sampling - off site.</p> <p>1500: at office. Pack samples for shipping.</p> <p>1700: end of day.</p>

Plans/Future Activities
<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>


08/02/11
 Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 CSTOP P20

Project #: TR0272

Field Personnel: JOE BARTLETT

Water Quality Meter - Model/Serial #: YSI 556 MDS / 08A100738

Turbidimeter - Model/Serial #: HACH 2100A / 110200007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		08/01/11	0758	23.13	8.562	142/8.56	80.8/100.0	P F
CAL ICV CCV		08/04/11	0740	23.10	8.562	9.16/8.56	107.0/100.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/01/11	0815	1.413	2002012	02-2012	1.483/1.413	P F
CAL ICV CCV		08/02/11	0800	"	8705	"	1.278/	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		08/01/11	0800	4.0	2002034	01-2012	3.91/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	6.99/7.00	P F
CAL ICV CCV				10.0	2002035	01-2012	10.01/10.00	P F
CAL ICV CCV			0745		2101326	07-2012	4.81/4.00	P F
CAL ICV CCV		08/02/11		5.4m	as above		6.55/7.0	P F
CAL ICV CCV							9.58/10.00	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/01/11	0820	240 @ 25	2244	03-2015	241.6/240.0	P F
CAL ICV CCV		08/02/11		"	"	"	242.0/	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		08/01/11	10.7	P F
CAL ICV CCV		08/02/11	10.8	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		08/01/11	19.9	P F
CAL ICV CCV		08/02/11	19.3	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		08/01/11	99	P F
CAL ICV CCV		08/02/11	100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		08/01/11	208	P F
CAL ICV CCV		08/02/11	245	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

- 1. See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: Fail DO CCV
Fail pH 4, 7, 10 CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TR0272 Field Personnel: JOE BARTSCIT

Water Quality Meter - Model/Serial #: VSI 556 MFS / 08A100738 Turbidimeter - Model/Serial #: HACH 2100R / 11020007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		08/02/11	1600	25.40	8.203	8.84	107.8	P (F)
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		08/02/11	11.0	P (F)
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/02/11	1615	1.413	8705	02-2012	1.460	P (F)
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		08/02/11	22.0	P (F)
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		08/02/11	1605	4.0	2002034	01-2012	3.93	P (F)
CAL ICV CCV				7.0	2002012	01-2012	5.20	P (F)
CAL ICV CCV				10.0	2101326	04-2012	8.16	P (F)
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		08/02/11	102	P (F)
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/02/11	1620	240@25	2244	03-2015	242.6	P (F)
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		08/02/11	796	P (F)
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: Fail DO, pH 7, pH 10 ccv



**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: LC34 Project #: TR0272 Field Personnel: D. Sizemore

Water Quality Meter - Model/Serial #: YSI 556 05D2373 Turbidimeter - Model/Serial #: Hach 2100Q 10010006392

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		8/1/11	845	22.81	8.611	8.09-8.61	100.2	P F
CAL ICV CCV		8/2/11	825	22.92	8.595	8.57-8.60	100.1	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		8/1/11	912	1.413	8705	2/12	1.203-1.413	P F
CAL ICV CCV		8/2/11	810816	"	"	"	1.229-1.413	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		8/1/11	859	4	2102011	1/13	4.23-4.00	P F
CAL ICV CCV		8/1/11	851	7	2101037	12/12	6.74-7.00	P F
CAL ICV CCV		8/1/11	903	10	2101326	7/12	10.64-10.00	P F
CAL ICV CCV		8/2/11	823	4	SAME		4.14-4.00	P F
CAL ICV CCV		8/2/11	820	7			7.53-7.00	P F
CAL ICV CCV		8/2/11	825	10			10.16-10.10	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		8/1/11	915	240±25°	2244	3/15	192.3-240.0	P F
CAL ICV CCV		8/2/11	826	"	"	"	195.0-240.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std 10 NTU			
Acceptance Criteria: +/- 10%			
CAL ICV CCV	8/1/11	10.6-10.00	P F
CAL ICV CCV	8/2/11	10.1-10.0	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std 20 NTU			
Acceptance Criteria: +/- 8%			
CAL ICV CCV	8/1/11	20.0	P F
CAL ICV CCV	8/2/11	18.0-20.0	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std ___ NTU			
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std ___ NTU			
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

Comments: Failed pH 7 CCV & ORP CCV
Failed Turb. CCV

- See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TR0272 Field Personnel: D. Sizemore

Water Quality Meter - Model/Serial #: YSI 55L 05D2373 Turbidimeter - Model/Serial #: Hach 2100 @ 10010C06392

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>151710</u>	<u>25.24</u>	<u>8.233</u>	<u>7.50</u>	<u>93.2</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>1711</u>	<u>1.413</u>	<u>8705</u>	<u>2/12</u>	<u>1.421</u>	P F
CAL ICV <u>CCV</u>								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>1717</u>	<u>4</u>	<u>210204</u>	<u>11/13</u>	<u>2.52</u>	P F
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>1713</u>	<u>7</u>	<u>2101037</u>	<u>12/12</u>	<u>7.14</u>	P F
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>1720</u>	<u>10</u>	<u>2101326</u>	<u>7/12</u>	<u>11.52</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV <u>CCV</u>		<u>8/2/11</u>	<u>1729</u>	<u>240 @ 25°</u>	<u>2244</u>	<u>3/15</u>	<u>198.9</u>	P F
CAL ICV <u>CCV</u>								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>10</u> NTU			
	<u>8/2/11</u>	<u>10.4</u>	P F
			P F
			P F
			P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>20</u> NTU			
	<u>8/2/11</u>	<u>21.0</u>	P F
			P F
			P F
			P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std ___ NTU			
			P F
			P F
			P F
			P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std ___ NTU			
			P F
			P F
			P F
			P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: Failed DO CCV; PH4; PH10 CCV and ORP CCV -



Failed: DO, pH, 7, 10, CV

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 08/01/11 Sampled By: JOE BARRETT

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Grundfos Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MRS Water Level Meter: Duckham

Time @ Start of Purging: 1032 Time @ End of Purging: 1052 Total Purging Time: 20 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 5.99 ft. 9702 Total Well Depth: 42 ft. BCS Reference: TOL Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BCS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments	
1032	Start	<u>Begin Purge</u>									<u>clear</u>	
1045	1.3	27.06	6.98	2.706	7.25	1.39	-201.3	0.49	1.764	1		
1047	1.5	26.58	7.02	2.740	5.77	1.41	-202.3	0.45	1.781	11		
1049	1.7	26.64	7.00	2.737	3.51	1.41	-207.1	0.40	1.779	11		
1052	2.0	26.61	6.98	2.738	5.59	1.41	-207.5	0.39	1.780	11		

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-201108.01 Time Collected: 1052 Comments: VOC, nBA, VFA, Br&I, TOC, Sulfide, M&E, Arsenic,

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.0026 \times 52 \times 0.25 = 0.34 \text{ gal}$

Alkalinity, Dissolved Metals.

FD(VOC): LC34-FD-201108.01-03

QC(VOC): LC34-RW0007-038.5-201108.01-D

* only filled 2 1/2 vials for VOC & nBA

Failed: DO, pH, 4, 7, 10 CCV

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 37 Date: 08/01/11 Sampled By: Joe Bartlett
 Station (Well ID): IW0002I Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1352 Time @ End of Purging: 1408 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 027.5 ft. (BTOC)
 Water Level: 6.21 ft. BTOC Total Well Depth: 30 ft. BLS Reference: 70C Well diameter: 2 in. Volume in well: 4.89 gal.
 Screen: 25-30 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1352	Start	Begin Purge								clear	
1402	1.0	27.09	6.74	1.889	9.08	0.95	-131.0	1.07	1.230	"	
1404	1.2	27.09	6.74	1.917	6.67	0.97	-135.9	0.99	1.248	"	
1406	1.4	26.96	6.75	1.936	6.01	0.98	-140.2	0.94	1.261	"	
1408	1.6	26.97	6.57	1.945	4.30	0.98	-143.1	0.91	1.265	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0002I-027.5-20110801
 Sample ID: _____ Time Collected: 1408 Comments: VOC, nBA, VFA, Br & I, TOC, Sulfide, MSE, Anions, Alkalinity, Dissolved Metals.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 40 + 0.25 = 0.31 gal
 FD (VFA): LC34-FD-20110801-010
 AC (VOC): LC34-IW0002I-027.5-20110801-D

Failed: DO, pH, 7, 10 CCV

Monitori Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 08/01/11 Sampled By: Joe Bartlett

Station (Well ID): IW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1257 Time @ End of Purging: 1315 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 037.5 ft. (BTOC)
 Water Level: 6.78 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 2 in. Volume in well: 6.52 gal.
 screen: 35-40 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1257	Start	<u>Begin Purge</u>								<u>clear</u>	
1307	1.0	27.57	6.99	3.646	5.13	1.91	-199.9	0.89	2.369	"	
1309	1.4	26.93	6.79	3.648	10.9	1.91	-201.4	0.83	2.371	"	
1313	1.6	26.83	6.83	3.655	8.07	1.92	-207.1	0.78	2.376	"	
1315	1.8	26.87	6.83	3.657	4.71	1.92	-211.0	0.76	2.378	"	

only 2 1/2 vials filled for VOC

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0002D-037.5-20110801
 Sample ID: _____ Time Collected: 1315 Comments: VOC & nBA, VFA, Br & I, TOC, Sulfide, MRE, Anions, Alkalinity, Dissolved Metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
~~When using 1/4 in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal~~
 $0.041 \times 0.035 \times 50 + 0.015 = 0.52 \text{ gal}$
 QC(VFA): LC34-IW0002D-037.5-20110801-D

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 8/11/04 Sampled By: D. Sizemore

Station (Well ID): BW0001A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump IP Purge Rate: 40.1 gpm Water Quality Meter (Make & Model): YS556 Water Level Meter: Solinst

Time @ Start of Purging: 1205 Time @ End of Purging: 1226 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.65 Total Well Depth: 26 ft. BIS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.52 gal

screen: 23-26 ft. BIS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1205	Start	26.82	7.61	1.156	3.59	.57	-37.1	.53	.75	Clear	
1212	.5	26.84	7.63	1.158	2.99	.57	-35.8	.52	.75	"	
1219	1.0	26.86	7.67	1.157	1.92	.57	-30.6	.43	.75	"	
1226	1.5	26.85	7.67	1.157	2.03	.57	-30.9	.41	.75	"	

Failed: ~~DO~~ pH 7, ORP, and turbidity CCV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001A-024.5-20110801
Sample ID: _____ Time Collected: 1226 Comments: only 2 40ml vials filled VOL 9 nBA, VFA, B & I, TOC, sulfide, ME8, Anions, Alkalinity, Dissolved Metals

When using 3/16-in. ID tubing EV=((0.041)-(0.035x tubing length))+(flow thru vol.)= _____ gal
When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal
0.0026x 36 + 0.25 = 0.35 gal

FD(VOC): LC34-FD-20110801-04 only 2 40ml Vials

Monitoring Well Sampling

Site: LC34 Project No.: TRO272 Task: 37 Date: 8/11/11 Sampled By: D. Sizemore

Station (Well ID): BW0001D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump II Purge Rate: 40.1 gpm Water Quality Meter (Make & Model): YSI 556 Water Level Meter: Solinet

Time @ Start of Purging: 1256 Time @ End of Purging: 1324 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)

Water Level: 5.62 Total Well Depth: 47 ft. - 8LS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.94 gal.

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 44-47 ft. BIS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Appearance - Color	Comments
1256	Start	27.31	7.65	1.906	74.6	16.3	-40.4	1.23	1.27	Cloudy	---
1303	.5	27.07	7.66	1.998	41.1	1.00	-32.5	.76	1.29	"	---
1310	1.0	27.02	7.67	1.999	9.31	1.01	-33.1	.33	1.30	Clear	---
1317	1.5	27.03	7.65	2.001	4.0	1.02	-32.9	.31	1.31	"	---
1324	2.0	26.99	7.69	2.002	4.2	1.03	-37.1	.24	1.32	"	---

Failed: pH, ORP and turbidity CCV.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001D - 045.5 - 20110801 Time Collected: 1324 Comments: VOC & nBA, VFA, Br & I, TOC, Sulfid, NH4, Anions, Alkalinity, Dissolved Metals.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = ___ gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = ___ gal

0.0026 x 57 + 0.25 = 0.40 gal.

FD(VOC): LC34 - FD - 20110801 - 025
QC(Alkalinity): LC34 - BW0001D - 045.5 - 20110801

Monitoring Well Sampling

Site: LL34 Project No.: TR6272 Task: 37 Date: 8/2/11 Sampled By: D. Sizemore

Station (Well ID): BW0002A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1042 Time @ End of Purging: 1103 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 6.04 Total Well Depth: 26 ft. BLS Reference: TCU Well diameter: 3/4 in. Volume in well: 0.52 gal
Screen: 23-26 ft. BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1042	Start	26.88	7.87	.916	7.29	.45	-21.7	1.13	.60	Clear	—
1049	.5	26.38	7.90	1.000	7.28	.49	-15.7	.50	.65	"	—
1056	1.0	26.35	7.85	.998	7.70	.49	-13.3	.62	.65	"	—
1103	1.5	26.36	7.87	.999	4.74	.49	-11.0	.65	.65	"	—
Failed: DO, pH 4, pH 10, and ORP CV.											

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LL34-BW0002A-024.5-20110802 Time Collected: 1103 Comments: VOC & nBA, VFA, Br & T, TOC, MEE,

When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

0.0026 x 36 + 0.25 = 0.34 gal

FD (Br & T): LL34-FD-20110802-05

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 8/2/11 Sampled By: D. Sizemore

Station (Well ID): BW0002C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump II Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: And Solinst

Time @ Start of Purging: 0916 Time @ End of Purging: 0937 Total Purging Time: 21 min. Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 6.41 Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.80 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
916	Start	26.30	7.16	2.704	3.77	1.39	-19.7	1.16	1.76	Clear	
923	.5	26.21	7.18	2.689	3.74	1.38	-15.9	1.04	1.75	"	
930	1.0	26.20	7.20	2.615	3.46	1.38	-15.6	1.00	1.77	"	
937	1.5	26.23	7.24	2.614	4.25	1.37	-15.3	.97	1.77	"	

Failed = DO, pH 4, pH 10, and ORP CVU.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW 0002C - 0305-20110802
Sample ID: _____ Time Collected: 937- Comments: VOC & nBA, VFA, Br & I, TOC, Sulfide, MEE, Anions,
Alkalinity
When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal
0.0026 x 50 + 0.25 = 0.38 gal.
FD (Anions) = LC34-FO-20110802-061

Monitori. Well Sampling

Site: LC34 Project No.: TRO272 Task: 37 Date: 8/2/11 Sampled By: D. Sizemore

Station (Well ID): BW00020 Purge Method: Pump Bailer Pump Type: ___ Submersible ___ Teflon ___ SS ___ Other ___ Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Quorum

Time @ Start of Purging: 1120 Time @ End of Purging: 1141 Total Purging Time: 21 min. Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 6.60 Total Well Depth: 47 ft. BLS Reference: TOL Well diameter: 3/4 in. Volume in well: 0.94 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screens: 44-47 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1120	Start	27.73	7.69	2.294	—	1.17	-19.3	2.58	1.49	Clear	—
1127	.5	26.36	7.68	2.365	1.41	1.21	-30.3	.40	1.19	"	—
1134	1.0	26.34	7.68	2.370	1.76	1.21	-21.7	.41	1.20	"	—
1141	1.5	26.37	7.68	2.371	1.23	1.20	-12.8	.24	1.21	"	—
Failed: DO, pH 4, pH 10, and ORP. CVV.											

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
- Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
- Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW00020-045.5-20110802 Time Collected: 1141 Comments: VOL, BA, VFA, Br & I, TOL, MEG

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + (\text{flow thru vol.}) = \underline{\quad} \text{ gal}$
 When using 1/4-in. ID tubing $EV = (0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) = \underline{\quad} \text{ gal}$
 $0.0026 \times 57 + 0.25 = 0.40 \text{ gal}$
 QC(VOL): LC34-BW00020-045.5-20110802-0
 LC34-FDA 20110802-00 (Br & I)

Monitoring Well Sampling

Site: CC34 Project No.: TRO272 Task: 37 Date: 08/02/11 Sampled By: Joe BARTUET

Station (Well ID): BW0003A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Creopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model): YSI 556 MP5 Water Level Meter: Duoham

Time @ Start of Purging: 1256 Time @ End of Purging: 1317 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.92 ft. BTOC Total Well Depth: 26 ft. BS Reference: TOL Well diameter: 3/4 in. Volume in well: 0.52 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 23-26 ft. BS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1256	Start	<u>Begin Purge</u>								<u>clear</u>	
1306	1.0	25.98	7.73	1.303	6.13	0.65	-146.6	2.57	0.847	11	
1309	1.3	25.85	7.85	1.300	7.05	0.65	-152.5	2.42	0.844	11	
1315	1.9	25.79	7.87	1.300	2.93	0.65	-168.4	2.14	0.845	11	
1317	2.1	25.83	7.86	1.301	2.92	0.65	-170.1	2.13	0.846	11	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: CC34 - BW0003A - 024.5 - 20110802 Time Collected: 1317 Comments: VOC9, VBA, VFA, BrqI, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = _____ gal

FD (MEE): CC34 - FD - 20110802 - 07

0.0026 x 36 + 0.25 = 0.34 gal

Monitoring Well Sampling

Site: LL34 Project No.: TR0272 Task: 37 Date: 08/02/11 Sampled By: Joce Bartlett

Station (Well ID): BW0003B Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Greepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Buckner

Time @ Start of Purging: 1206 Time @ End of Purging: 1222 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 6.12 ft. BTOL Total Well Depth: 33 ft. BLS Reference: TOL Well diameter: 3/4 in. Volume in well: 0.66 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1206	Start	Begin Purge									
1216	1.0	25.95	7.55	1.800	1.17	0.91	-138.6	2.66	1.172	"	
1218	1.2	25.83	7.57	1.811	1.11	0.92	-149.5	2.75	1.178	"	
1220	1.4	25.83	7.55	1.818	0.92	0.92	-155.5	2.84	1.182	"	
1222	1.6	25.78	7.53	1.828	0.95	0.92	-166.7	2.85	1.189	"	
Fail pH 7, pH 10 CCU											
Fail DO CCU											

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LL34-BW0003B-031.5-20110802 Time Collected: 1222 Comments: VOC94BA, VFA, Br&I, TOC, MSE

When using 3/16-in. ID tubing EV = $(0.041)(0.035 \times \text{tubing length}) + (\text{flow thru vol.}) =$ gal

When using 1/4-in. ID tubing EV = $(0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) =$ gal

$0.0026 \times 4390.25 = 0.36 \text{ gal}$

QC (TOC): LL34-BW0003B-031.5-20110802 - D

Monitoring Well Sampling

Site: LC34 Project No.: T R0272 Task: 37 Date: 08/02/11 Sampled By: JOE BARTLETT

Station (Well ID): BW0003C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Burham

Time @ Start of Purging: 1043 Time @ End of Purging: 1100 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.05 ft. BTOC Total Well Depth: 40 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 0.8 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1043</u>	<u>Start</u>	<u>Begin Purge</u>								<u>clear</u>	
<u>1053</u>	<u>1.0</u>	<u>26.08</u>	<u>6.85</u>	<u>3.096</u>	<u>18.3</u>	<u>1.61</u>	<u>-250.7</u>	<u>1.43</u>	<u>2.012</u>	<u>//</u>	
<u>1055</u>	<u>1.2</u>	<u>26.07</u>	<u>6.88</u>	<u>3.090</u>	<u>3.62</u>	<u>1.61</u>	<u>-256.9</u>	<u>1.38</u>	<u>2.008</u>	<u>//</u>	
<u>1057</u>	<u>1.4</u>	<u>26.15</u>	<u>6.87</u>	<u>3.073</u>	<u>4.07</u>	<u>1.60</u>	<u>-264.1</u>	<u>1.32</u>	<u>1.999</u>	<u>//</u>	
<u>1100</u>	<u>1.7</u>	<u>26.21</u>	<u>6.88</u>	<u>3.067</u>	<u>3.20</u>	<u>1.59</u>	<u>-275.7</u>	<u>1.26</u>	<u>1.993</u>	<u>//</u>	
			<u>Fail ORP, pH 10</u>					<u>Fail DO</u>	<u>CCV</u>		
			<u>CCV</u>								

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003C-038.5-20110802

Sample ID: _____ Time Collected: 1100

Comments: VOC & nBA, VFA, Br & I, TOC, Sulfide, MEE, Anions,

When using 3/16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + (flow thru vol.) = _____ gal Alkalinity

When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = _____ gal

0.0026 x 50 x 0.25 = 0.33 gal

FD (Alkalinity): LC34-FD-20110802-04

QC (Sulfide): LC34-BW0003C-038.5-20110802-10

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 08/02/11 Sampled By: Joe Bartlett

Station (Well ID): BW0003D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Croopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Duolane

Time @ Start of Purging: 1340 Time @ End of Purging: 1356 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 0.45.5 ft. (BTCL)

Water Level: 10.08 ft. BTCL Total Well Depth: 47 ft. BCL Reference: 102 Well diameter: 3/4 in. Volume in well: 0.94 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 44-47 ft. BCL

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1340	Start	Begin Purge								Clear	
1350	1.0	27.16	6.82	2.977	7.41	1.54	-250.9	1.54	1.939	"	
1352	1.2	27.05	6.82	2.980	6.71	1.54	-256.4	1.37	1.938	"	
1354	1.4	27.22	6.82	2.984	5.25	1.55	-259.6	1.32	1.941	"	
1356	1.6	27.10	6.95	2.983	5.04	1.55	-268.1	1.24	1.940	"	
			Fail pH 7, pH 10 CW				Fail DO		CCV		

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003D-045.5-20110802 Time Collected: 1356 Comments: VOL % nBA, VFA, Br & I, TOC, MSE

When using 3/16 in. ID tubing EV = ((0.041) (0.035 x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = _____ gal

FD (VFA): LC34-FD-20110802-08

0.0026 x 57 + 0.25 = 0.40 gal

Facted: DO, pH, 4,7,10 COV

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 08/01/11 Sampled By: Joe Bartlett

Station (Well ID): IW0002D1 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Greypump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1125 Time @ End of Purging: 1142 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 6.61 ft. BTOC Total Well Depth: 55 ft. BLS Reference: TOL Well diameter: 2 in. Volume in well: 8.97 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 50-55 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1125	Start	Begin Purge								clear	
1135	1.0	26.60	7.16	2.902	17.5	1.50	-243.1	0.61	1.887	11	
1137	1.2	26.52	7.13	2.900	15.8	1.50	-244.0	0.57	1.884	11	
1140	1.5	26.56	7.13	2.899	13.4	1.50	-247.2	0.54	1.883	11	
1142	1.7	26.54	7.11	2.900	14.8	1.50	-249.9	0.53	1.885	11	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-FW0002D1-052.5-20110801 Time Collected: 1142 Comments: VOL% nBA, VFA, Br & I, TOL, Sulfide, MES, Anions,

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal Alkalinity, Dissolved Metals
 When using 1/4-in. ID tubing EV = ((0.0026x tubing length) + (flow thru vol.)) = gal AL (MES): LC34-IW0002D1-052.5-20110801-D

0.041 x 0.035 x 65 + 0.25 = 0.34 gal. AL (Diss. Metals): LC34-FW0002D1-052.5-20110801-D

Monitori Well Sampling

Site: LL34 Project No.: TR0272 Task: 37 Date: 08/02/11 Sampled By: Joe Bartlett

Station (Well ID): BW0003F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) V Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MFS Water Level Meter: Ducham

Time @ Start of Purging: 0927 Time @ End of Purging: 0943 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 6.08 ft. BTOC Total Well Depth: 61 ft. BLS Reference: TOC Well diameter: 3/4 in. Volume in well: 1.22 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen: 58-61 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>0927</u>	<u>Start</u>	<u>begin purge</u>								<u>clear</u>	
<u>0937</u>	<u>1.0</u>	<u>25.87</u>	<u>7.68</u>	<u>2.781</u>	<u>1.74</u>	<u>1.44</u>	<u>-231.0</u>	<u>1.27</u>	<u>1.808</u>	<u>"</u>	
<u>0939</u>	<u>1.2</u>	<u>25.65</u>	<u>7.80</u>	<u>2.779</u>	<u>2.67</u>	<u>1.44</u>	<u>-237.8</u>	<u>1.26</u>	<u>1.806</u>	<u>"</u>	
<u>0941</u>	<u>1.4</u>	<u>25.59</u>	<u>7.84</u>	<u>2.779</u>	<u>1.47</u>	<u>1.44</u>	<u>-242.0</u>	<u>1.26</u>	<u>1.805</u>	<u>"</u>	
<u>0943</u>	<u>1.6</u>	<u>25.57</u>	<u>7.80</u>	<u>2.775</u>	<u>1.32</u>	<u>1.43</u>	<u>-247.8</u>	<u>1.25</u>	<u>1.803</u>	<u>"</u>	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LL34-BW0003F-059.5-20110802 Time Collected: 0943 Comments: VOC & nBA, VFA, Bn & I, TOC, MEE

When using 3/16-in. ID tubing $EV = ((0.041)(0.035 \times \text{tubing length})) + (\text{flow thru vol.}) = \text{gal}$

When using 1/4-in. ID tubing $EV = (0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) = \text{gal}$

$0.0026 \times 71 + 0.25 = 0.43 \text{ gal}$

FD(MEE): LL34-FD-20110802-02

Failed: DO, pH, 4, 7, 10 CW

Monitori Well Sampling

Site: LC34 Project No.: TR0272 Task: 37 Date: 08/01/11 Sampled By: Joe Bartlett

Station (Well ID): IW0076 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Greepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1444 Time @ End of Purging: 1501 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 075.0 ft. (BTOC)

Water Level: 6.68 ft. BTOC Total Well Depth: 80 ft. BLS Reference: TOL Well diameter: 2 in. Volume in well: 13.04 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screens: 70-80 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1444	Start	Begin Purge								clear	
1455	1.1	26.08	7.78	2.516	32.6	1.29	-151.4	1.86	1.636	4	
1457	1.3	25.99	7.69	2.521	17.4	1.30	-149.4	1.81	1.639	4	
1459	1.5	25.95	7.78	2.525	14.9	1.30	-151.6	1.81	1.641	"	
1501	1.7	25.94	7.78	2.527	14.4	1.30	-152.0	1.79	1.643	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0076-075.0-20110801 Time Collected: 1501 Comments: VOL, nBA, VFA, B, I, TOL, MEE, Dissolved Metals

When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

0.0026 x 90 + 0.25 = 0.46 gal FD (Diss. Metals) = LC34-FD-20110801-0.2

Project: <u>LC34</u>	Date: <u>8/3/11</u>
Project No.: <u>TR0272</u>	Task No.: _____
Contractors: <u>EDS Glen Pennington; Sean Cripe</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: <u>DPT 332, 333, 334</u>	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
<p>0725 DMS arrives site, EDS crew is onsite. DMS conducts tailgate meeting w/ safety discussion. DMS and drilling set up for DPT macro core sampling.</p> <p>811 Begin macro core sampling. Macro core sampled by cutting a 1/2-1" strip from sampler line. Strip is removed and immediately covered w/ aluminum foil. Foil is punctured w/ a screwdriver. PID meter probe is inserted into foil / soil cavity made by screwdriver. PID responses are recorded on ^{PRE} boring logs. Cores sampled screened @ 1' intervals. Soil samples for lab analysis were collected based on lithology and PID responses.</p> <p>1015 DPT 0332 Complete; set up for DPT 0333.</p> <p>1023 DPT 0333 ^{PRE} Begin DPT 0333.</p> <p>1230 DPT 0333 Complete; begin setting up for DPT 0334.</p> <p>1312 DPT 0334 ^{PRE} Complete Begin DPT 0334.</p> <p>1543 DPT 0334 Complete; Begin Grouting DPTs. DMS Collects IDW Samples.</p>

Plans/Future Activities


 _____ 8/3/11
 Signature/Date

Project: <u>LC34</u>	Date: <u>8/13/11</u>
Project No.: <u>T20272</u>	Task No.: _____
Contractors: <u>EDS</u>	_____

Work Performed

Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern

1630 Grouting DPTs complete, begin cleaning up & securing site. Dms inventory drums and securing drum pallets.

1643 Drillers depart site; Dms continues securing drums and securing pallets; packaging PID meter and finishing daily notes.

1655 Dms departs site.

Plans/Future Activities

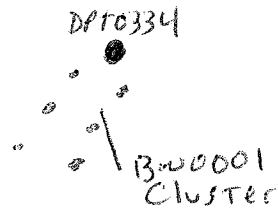
 8/13/11
Signature/Date

BORING LOG

BOREHOLE LOCATION MAP



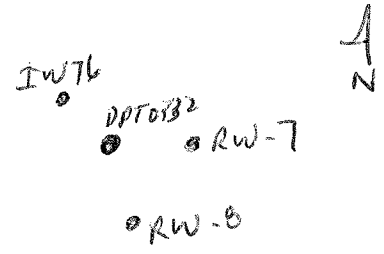
BORING NO.: DPT0334 PROJECT NO.: TR0272 PAGE 1 OF 1
 SITE: LC34 DATE: 8/3/11
 TOOLS AND METHOD: Macro BIT DIA: 2"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: ~6.0'
 DRILLING COMPANY: ECS RIG: Geoprobe
 DRILLERS: Glen Pennington LOGGERS: Sean Crisp



LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
				start time: 1312 stop time: 1543
Gray silty fine to medium SAND w/ fragmented shell (<5%)	Macro Sampler	26	0.4	
		27	0.9	
		28	1.3	
		29	11.5	
Same w/ whole and fragmented shell (25%) below 30'	Macro Sampler	30		
		31	0.5	
		32	4.7	
		33	3.3	
		34	2.1	
		34.5	23.2	Grab Sample DPT-334-34.5 collected @ 1404
Gray & black silty medium SAND w/ whole and fragmented shell (45%)	Macro Sampler	35		
		36	5.3	
		37	0.4	Grab Sample DPT0334-37.0 collected @ 1413
		38	3.8	
		39	1.8	
		40		
		41	0.0	
		42	0.4	
		43	0.4	
Gray silty fine to medium SAND w/ very little shell (<1%) below 43.5'	Macro Sampler	44	18.5	
		45		Grab Sample DPT0334-45.5 collected @ 1457
Gray CLAY w/ fragmented shell (<5%) med-high plasticity below 45'	Macro Sampler	46	10.7	Grab sample DPT0334-47.0 collected @ 1507
		47	6.9	Grab Sample DPT0334-48.5 collected @ 1513
		48	3.6	
Gray silty medium SAND w/ some fragmented shell (10-15%) below 49'	Macro Sampler	49	3.7	
		50		
		51	7.6	
Same	Macro Sampler	52	0.3	Grab Sample DPT0334-53.0 @ 1532
		53	1.3	
		54	0	
		55	0	
		56	0	
		57	0	
Same	Macro Sampler	58	0	
		59	0	
		60	0	
				Boring terminated @ 60' and abandoned w/ Grout

BORING LOG

BOREHOLE LOCATION MAP

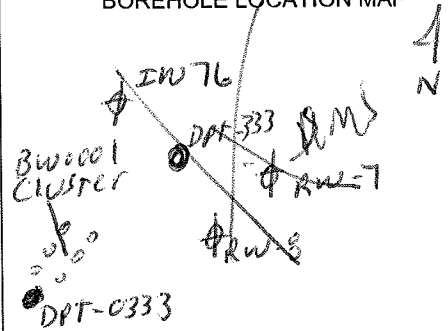


BORING NO.: DPT0332 PROJECT NO.: TR0272 PAGE 1 OF 1
 SITE: LC34 DATE: 8/3/11
 TOOLS AND METHOD: Macro Core Sampler BIT DIA: 2"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: ~6.0'
 DRILLING COMPANY: EDS RIG: GeoProbe
 DRILLERS: Glen Pennington LOGGERS: D. S. Lemore
Sean Cripe

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
				Start Time: 811 Stop Time: 1015
Gray fine to medium SAND w/ fragmented shell (5%-10%)	Macro Sampler	26	0.5	
	Macro Sampler	27	1.1	
	Macro Sampler	28	1.0	
	Macro Sampler	29	4.0	
	Macro Sampler	30		
	Macro Sampler	31	0.8	
	Macro Sampler	32	0.1	
	Macro Sampler	33	2.0	
Gray silty fine SAND w/ fragmented shell (30%-40%) below 34'	Macro Sampler	34	1.8	
	Macro Sampler	35		
	Macro Sampler	36	2.2	
	Macro Sampler	37	0.1	- Grab Sample DPT 0332-37 @ 903
	Macro Sampler	38	2.4	
	Macro Sampler	39	16.6	
40'-41' no recovery	Macro Sampler	40		
	Macro Sampler	41	44.1	
	Macro Sampler	42	17.2	
Gray Sandy Silty CLAY w/ Low plasticity below 43'	Macro Sampler	43	21.3	- Grab Sample DPT 0332-43.5 @ 921
same w/ medium to high plasticity below 44'	Macro Sampler	44		
	Macro Sampler	45	4.0	- Grab Sample DPT 0332-45.0' @ 947
	Macro Sampler	46	7.9	
	Macro Sampler	47	3.9	
Gray Silty fine SAND w/ fragmented shell (micro) below 48.5'	Macro Sampler	48	4.2	- Grab Sample DPT 0332-48.0 collected @ 956
	NO SAMPLE	49		
	Macro Sampler	50		
	Macro Sampler	51	0	
	Macro Sampler	52	0	
same	Macro Sampler	53	0	- Grab Sample DPT 0332-53.0 collected @ 1013
	Macro Sampler	54	0	
	Macro Sampler	55	0	
	Macro Sampler	56	0	
same	Macro Sampler	57	0	
	Macro Sampler	58	0	
	Macro Sampler	59	0	
	Macro Sampler	60	0	
Note: photos for DPT 0332 mislabeled DPT 0232 in photos.				Boring terminated @ 60' and abandoned w/ grout

BORING LOG

BOREHOLE LOCATION MAP



BORING NO.: DPT 0333 PROJECT NO.: TRO272 PAGE 1 OF 1
 SITE: LC34 DATE: 6/13/11
 TOOLS AND METHOD: Macro Core Sampler BIT DIA: 2"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: ~6'
 DRILLING COMPANY: EDS RIG: Geoprobe
 DRILLERS: Glen Pennington LOGGERS: P. Sizemore
Sean Crisp

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
				Start Time: 1023 Stop Time: 1236
Gray fine to medium SAND w/ some fragmented shell (<10%)	Macro Sampler	26	0	Check - A PID Meter Calibration w/ 100 ppm ISO Cal. Gas: Reading = 93.8
	Macro Sampler	27	0.1	
	Macro Sampler	28	0.2	
	Macro Sampler	29	0.3	
	Macro Sampler	30	1.2	
	Macro Sampler	31	0.6	
	Macro Sampler	32	0	
	Macro Sampler	33	0	
	Macro Sampler	34	0.6	
Same w/ whole and fragmented shell (30%-40%) below 35'	Macro Sampler	35	0.6	
	Macro Sampler	36	8.3	
	Macro Sampler	37	11.4	Grab Sample DPT0333-37 collected @ 1114
	Macro Sampler	38	1.1	
	Macro Sampler	39	9.0	
	Macro Sampler	40	0	
	Macro Sampler	41	6.5	
	Macro Sampler	42	9.3	
44' Gray silty fine SAND	Macro Sampler	43	10.6	
45' Gray CLAY w/ fragmented shell (<10%), Med plasticity	Macro Sampler	44	158.0	Grab Sample DPT0333-44.0 collected @ 1128
	Macro Sampler	45	0	Grab Sample DPT0333-45.5 @ 1150
	Macro Sampler	46	3.3	
	Macro Sampler	47	7.6	Grab Sample DPT0333-47.0 @ 1155
Gray shell flash from 49'-49.5'	Macro Sampler	48	8.8	
Gray silty fine SAND w/ fragmented shell (<10%) below 49.5'	Macro Sampler	49	2.1	Grab Sample DPT0333-48.5 @ 1157
	Macro Sampler	50	0	
	Macro Sampler	51	0	
	Macro Sampler	52	0	
Same w/ whole & fragmented shell (40%) below 54'	Macro Sampler	53	0	Grab Sample DPT0333-53.0 collected @ 1227
	Macro Sampler	54	0	
	Macro Sampler	55	0	
	Macro Sampler	56	0	
	Macro Sampler	57	0	
	Macro Sampler	58	0	
	Macro Sampler	59	0	
	Macro Sampler	60	0	
				Boring terminated @ 60' and abandoned w/ GROUT

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272

Field Personnel: JOE BARTLETT

Water Quality Meter - Model/Serial #: YSI 556 MP3 / 097100228

Turbidimeter - Model/Serial # HANU 2100A / 10110C 006392

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/- 0.3mg/L		
CAL ICV CCV		08/12/11	0812	21.71	8.794	9.37/8.79	106.7/100.0	P F
CAL ICV CCV		"	1303	19.44	7.638	8.03	112.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
							Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/12/11	0827	1.413	8809	03-2012	1.376/1.413	P F
CAL ICV CCV		"	1319	"	"	"	0.924	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
							Acceptance Criteria: +/- 0.2 SU	
CAL ICV CCV		08/12/11	0815	2.0	2002034	01-2012	4.08/2.00	P F
CAL ICV CCV				7.0	2002012	01-2012	7.05/7.00	P F
CAL ICV CCV				10.0	2101320	07-2012	9.89/9.99	P F
CAL ICV CCV			1305	"	"	"	4.09	P F
CAL ICV CCV				"	"	"	6.90	P F
CAL ICV CCV				"	"	"	9.91	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
							Geosyntec Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/12/11	0833	240 @ 25	2244	03-2015	245.5/240.0	P F
CAL ICV CCV		"	1321	"	17	"	230.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 10%	
CAL ICV CCV		08/12/11	10.8	P F
CAL ICV CCV		"	13.4	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 8%	
CAL ICV CCV		08/12/11	20.6	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 6.5%	
CAL ICV CCV		08/12/11	101	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std <u>200</u> NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/12/11	802	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: Fail turbidity CCV Fail Sp. Cond CCV
Fail pH 4 CCV Fail DO CCV



Monitori Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/12/11 Sampled By: Joe Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): beepump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst.

Time @ Start of Purging: 1032 Time @ End of Purging: 1048 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 4.77 ft. BTOC
7.69 Total Well Depth: 57 ft. BLS Reference: TOC Well diameter: 6 in. Volume in well: 83.7 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1032	Start	27.02	8.36	2.829	33.8	1.40	-278.1	1.51	1.767	clear	
1042	1.0	26.35	8.23	2.822	16.6	1.42	-247.8	0.26	1.790	"	
1044	1.2	26.22	8.20	2.852	11.5	1.44	-254.3	0.36	1.802	"	
1046	1.4	26.46	8.14	2.863	9.28	1.45	-259.8	0.32	1.821	"	
1048	1.6	26.20	8.11	2.870	8.28	1.45	-261.9	0.26	1.823	"	

Failed Turbidity, pH, DO, Sp. Conductance 1st.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-20110812
 Sample ID: _____ Time Collected: 1048 Comments: VOL TNBA, VFA, Br⁻, TOC, Sulfide, M&E, Anions,
 When using 3/16 in. ID tubing $EV = ((0.041) \cdot (0.035 \cdot \text{tubing length})) + (\text{flow thru vol.}) = \text{gal}$ Alkalinity, Dissolved Metals
 When using 1/4-in. ID tubing $EV = (0.0026 \cdot \text{tubing length}) + (\text{flow thru vol.}) = \text{gal}$
 $0.0026 \times 67 + 0.25 = 0.42 \text{ gal.}$

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LL34

Project #: TR0272

Field Personnel: J. BARILETT

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 AK

Turbidimeter - Model/Serial #: HACH 2100 Q / 10110C006392

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/- 0.3mg/L		
CAL ICV CCV		08/18/11	0817	21.94	8.761	8.35/8.76	95.2/100.0	P F
CAL ICV CCV		"	1329	23.16	8.546	8.52	99.6	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
							Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/18/11	0824	1.413	8809	03-2012	1.410/1.413	P F
CAL ICV CCV		"	1336	"	"	"	1.405	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
							Acceptance Criteria: +/- 0.2 SU	
CAL ICV CCV		08/18/11	0819	4.0	2002034	01-2012	4.0/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	7.09/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	9.83/9.77	P F
CAL ICV CCV			1330	"	"	"	4.02	P F
CAL ICV CCV				"	"	"	7.05	P F
CAL ICV CCV				"	"	"	9.95	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
							Geosyntec Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/18/11	0827	240 @ 25	2244	03-2015	236.6/240.0	P F
CAL ICV CCV		"	1339	"	"	"	238.6	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 10%	
CAL ICV CCV		08/18/11	9.38	P F
CAL ICV CCV		"	9.89	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 8%	
CAL ICV CCV		08/18/11	20.0	P F
CAL ICV CCV		"	20.3	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 6.5%	
CAL ICV CCV		08/18/11	101	P F
CAL ICV CCV		"	102	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 800 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 5%	
CAL ICV CCV		08/18/11	800	P F
CAL ICV CCV		"	793	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/18/11 Sampled By: J. BARTLETT

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1003 Time @ End of Purging: 1018 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.31 ft. BTOL Total Well Depth: 42 ft. BLS Reference: TOC Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1003	Start	26.34	6.79	2.314	9.84	1.18	-237.2	1.23	1.502	clear	
1013	1.0	26.44	6.79	2.394	3.04	1.23	-251.2	0.69	1.556	"	
1015	1.2	26.45	6.80	2.393	2.26	1.23	-260.5	0.59	1.556	"	
1018	1.5	26.48	6.80	2.386	7.78	1.22	-279.9	0.49	1.551	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20110818
 Sample ID: _____ Time Collected: 1018 Comments: Vol + nBA, VFA, Br & I w/ Anions, TOC, Sulfide, MCE, Alkalinity, Dissolved Metals.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 0.041 x 0.035 x 52' + 0.25 = 0.32 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/18/11 Sampled By: J. BARTLETT

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Burham

Time @ Start of Purging: 1047 Time @ End of Purging: 1105 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 5.20 A-BTDC Total Well Depth: 57 ft BLS Reference: TOC Well diameter: 6 in. Volume in well: 83.7 gal

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 47-57 ft BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1047	Start	26.58	7.05	2.651	22.8	1.36	-252.1	1.54	1.722	clear	
1059	1.2	26.39	6.97	2.638	3.51	1.36	-279.1	0.22	1.715	"	
1101	1.4	26.69	6.99	2.645	3.36	1.36	-246.2	0.24	1.719	"	
1103	1.6	26.71	6.98	2.655	3.46	1.37	-244.6	0.29	1.728	"	
1105	1.8	26.51	6.98	2.664	3.20	1.37	-246.2	0.34	1.732	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - RW0008 - 052.0 - 20110818
 Sample ID: _____ Time Collected: 1105 Comments: VOC + uBA, VFA, Br & I Anions, TOC, Sulfide, MSE,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal Alkalinity, Dissolved Metals.
 When using 1/4 in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 $0.041 \times 0.035 \times 67 + 0.25 = 0.35 \text{ gal.}$

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: L034

Project #: TR0272

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 AK

Turbidimeter - Model/Serial # HACH 2100A / 10110C006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>0857</u>	<u>23.99</u>	<u>8.418</u>	<u>8.45/8.42</u>	<u>100.2/100.0</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1903</u>	<u>20.70</u>	<u>8.012</u>	<u>8.60</u>	<u>109.6</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

0.1 - 10 NTU	Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>9.18</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>9.36</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>0903</u>	<u>1.413</u>	<u>8809</u>	<u>03-2012</u>	<u>1.380/1.413</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1209</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>1.420</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

11 - 40 NTU	Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>20.1</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>20.1</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>0900</u>	<u>4.0</u>	<u>2002024</u>	<u>01-2012</u>	<u>4.06/4.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>↓</u>	<u>↓</u>	<u>7.0</u>	<u>2002012</u>	<u>01-2012</u>	<u>7.02/7.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>↓</u>	<u>↓</u>	<u>10.0</u>	<u>2101326</u>	<u>07-2012</u>	<u>10.02/10.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1706</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>2.91</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>↓</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>6.07</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>↓</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>9.90</u>	<u>P</u> <u>F</u>

41 - 100 NTU	Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>96.1</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>106</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>0905</u>	<u>240 @ 25</u>	<u>2244</u>	<u>03-2015</u>	<u>237.3/240.0</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>		<u>"</u>	<u>"</u>	<u>"</u>	<u>236.5</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

>100 NTU	Std <u>300</u> NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>08/24/11</u>	<u>806</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>802</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>				<u>P</u> <u>F</u>

Specific Conductance Probe Cleaned? Yes (No) Dissolved Oxygen membrane Changed? Yes (No)

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Comments: fail 00 CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/24/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Greepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1053 Time @ End of Purging: 1108 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.45 ft. BTOC Total Well Depth: 42 ft. BLS Reference: TOL Well diameter: 6 in. Volume in well: 61.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1053	Start	26.76	6.78	2.605	3.72	1.37	-273.2	2.93	1.733	clear	
1103	1.0	26.82	6.76	2.718	1.21	1.40	-257.5	0.94	1.767	"	
1106	1.3	26.71	6.75	2.722	1.25	1.40	-260.6	0.76	1.770	"	
1108	1.5	26.73	6.75	2.728	1.77	1.41	-251.8	0.63	1.773	"	

Failed DO CCV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20110824
 Sample ID: _____ Time Collected: 1108 Comments: VOC + PBA, TOL, MEQ, VFA, SulRide, Br & I w/ Anions, Soluble Metals, Alkalinity
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 0.041 x 0.035 x 52 x 10.25 = 0.32 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/24/11 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) XSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1133 Time @ End of Purging: 1150 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 9.89 ft BTOC Total Well Depth: 57 ft. BLS Reference: TU Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1133	Start	26.87	7.12	3.682	1.62	1.38	-274.9	0.66	1.740	cloudy	
1143	1.0	27.38	7.01	2.716	3.07	1.40	-247.7	0.36	1.765	clear	
1146	1.3	27.36	7.01	2.720	2.78	1.40	-259.6	0.67	1.769	"	
1150	1.7	27.27	7.01	2.733	3.09	1.41	-249.7	0.52	1.777	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008--052.0-20110824 Time Collected: 1150 Comments: VOC, inBA, TOC, NH4, VFA, Sulfide, Boron, I w/ Anions, Soluble Metals, Alkalinity

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV= (0.0026xtubing length)+(flow thru vol.)= _____ gal

0.041 x 0.035 x 67 + 0.25 = 0.35 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TRO272

Field Personnel: J. BARTLETT

Water Quality Meter - Model/Serial #: YSI 556 MAS / 09F100228

Turbidimeter - Model/Serial # HACH 2100 Q / 110200007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		08/31/11	0821	23.91	8.424	8.79/8.43	104.2/100.0	P F
CAL ICV CCV		"	1627	25.23	8.233	8.53	103.4	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV	10	08/30/11	10.9	P F
CAL ICV CCV	"	"	10.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/31/11	0834	1.413	8809	03-2012	1.555/1.413	P F
CAL ICV CCV		"	1638	"	"	"	1.421	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV	20	08/30/11	19.5	P F
CAL ICV CCV	"	"	21.1	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		08/31/11	0824	4.0	2002034	01-2012	3.88/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	7.50/7.00	P F
CAL ICV CCV				10.0	2101226	07-2012	9.5/10.00	P F
CAL ICV CCV			1630	"	"	"	4.16	P F
CAL ICV CCV				"	"	"	6.83	P F
CAL ICV CCV				"	"	"	9.95	P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV	100	08/31/11	99.5	P F
CAL ICV CCV	"	"	100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		08/31/11	0838	240@25	2244	03-2015	235.4/240.0	P F
CAL ICV CCV		"	1640	"	"	"	233.4	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV	200	08/31/11	78.9	P F
CAL ICV CCV	"	"	81.3	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 38 Date: 08/31/11 Sampled By: J. BARTUSIT

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Grundfos Purge Rate: 60.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1035 Time @ End of Purging: 1051 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 5.40 ft. BTOC Total Well Depth: 57 ft. BLS Reference: 700 Well diameter: 6 in. Volume in well: 83.7 gal
47-57 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1035	Start	26.38	8.29	2.612	4.81	1.31	-283.8	0.59	1.655	cloudy	
1045	1.0	26.40	8.15	2.629	4.84	1.32	-292.7	0.29	1.665	clear	
1048	1.3	26.60	7.87	2.648	2.72	1.32	-283.5	0.12	1.666	"	
1051	1.6	26.59	7.80	2.648	2.46	1.32	-293.8	0.07	1.673	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - RW0008 - 052.0 - 20110831
 Sample ID: _____ Time Collected: 1051 Comments: VOC + NPA, TOC, M40, VFA, Br + I w/ Aridans, Sulfide, Dissolved Metals, Alkalinity, DHC + UREA.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 67 + 0.25 = 0.35 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272 Task: 39 Date: 08/31/11 Sampled By: J. BARTLETT

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 552 MPS Water Level Meter: Duckhorn

Time @ Start of Purging: 0954 Time @ End of Purging: 1009 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.44 A BTOC Total Well Depth: 42 A BLS Reference: TOC Well diameter: 6 in. Volume in well: 61.7 gal
30-42 A BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>0954</u>	<u>Start</u>	<u>26.81</u>	<u>7.49</u>	<u>2.654</u>	<u>4.91</u>	<u>1.32</u>	<u>-284.6</u>	<u>0.85</u>	<u>1.671</u>	<u>clear</u>	
<u>1004</u>	<u>1.0</u>	<u>26.34</u>	<u>7.44</u>	<u>2.589</u>	<u>1.40</u>	<u>1.30</u>	<u>-295.7</u>	<u>0.23</u>	<u>1.639</u>	<u>"</u>	
<u>1006</u>	<u>1.2</u>	<u>26.49</u>	<u>7.40</u>	<u>2.585</u>	<u>0.88</u>	<u>1.29</u>	<u>-290.7</u>	<u>0.18</u>	<u>1.634</u>	<u>"</u>	
<u>1009</u>	<u>1.5</u>	<u>26.50</u>	<u>7.34</u>	<u>2.582</u>	<u>1.61</u>	<u>1.29</u>	<u>-280.3</u>	<u>0.17</u>	<u>1.632</u>	<u>"</u>	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20110831
 Sample ID: _____ Time Collected: 1009 Comments: VOC/MSA, TOC, MEE, VFA, Br + I w/ Arsenic, Sulfide, Dissolved Metals, Alkalinity, Dbc + verA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 52 + 0.25 = 0.32 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 ESPCP R20

Project #: 1R0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 096101376

Turbidimeter - Model/Serial #: HACH 21002 / 10110C 006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	0916	23.83	8.450	8.11/8.45	105.6/100.0	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1559	27.56	7.818	7.92	100.2	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	10.5	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	9.89	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	0929	1413	8809	03-2012	1.389/1.413	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1605	"	"	"	1.433	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	20.9	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	20.6	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	0918	4.0	2002034	01-2012	3.99/4.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	↓	4.0	2002012	01-2012	6.98/7.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	↓	10.0	2101326	01-2012	9.98/10.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1601	"	"	"	4.02	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	↓	"	"	"	6.96	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	↓	"	"	"	9.93	<input checked="" type="checkbox"/> P <input type="checkbox"/> F

41 - 100 NTU	Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	109	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	106	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	0927	240 @ 25	2244	03-2015	240.6/240.0	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1608	"	"	"	236.5	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std <u>200</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		09/15/11	210	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	209	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: 120272A Task: 38 Date: 09/15/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Cropump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YS1556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1229 Time @ End of Purging: 1245 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.16 ft. BTOC Total Well Depth: 42 ft. BU Reference: tol Well diameter: 6 in. Volume in well: 6.17 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
35-42 ft. BGS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1229	Start	27.30	7.19	2.568	15.7	1.32	-276.7	1.93	1.675	clear	
1239	1.0	27.26	7.05	2.663	0.97	1.37	-302.9	1.84	1.732	"	
1242	1.3	27.12	7.05	2.657	0.84	1.37	-312.2	1.66	1.727	"	
1245	1.6	27.10	7.06	2.656	0.82	1.37	-308.0	1.67	1.725	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-03815-20110915 Time Collected: 1245 Comments: VOC + NBA, MS9, VFA, TOC, Dissolved Metals, Alkalinity, Sulfide, B & J w Arsenic.

When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + (\text{flow thru vol.}) = \text{gal}$

When using 1/4-in. ID tubing $EV = (0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) = \text{gal}$

$0.041 \times 0.035 \times 52 + 0.25 = 0.32 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: JRO2704 Task: 38 Date: 09/15/11 Sampled By: J. Brothelt

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo pump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MMS Water Level Meter: Folclust

Time @ Start of Purging: 1307 Time @ End of Purging: 1323 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 52 ft. (BTOT)

Water Level: 6.87 ft. BTOT Total Well Depth: 57 ft. BLS Reference: TOL Well diameter: 6 in. Volume in well: 83.7 gal
47-57 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1307	Start	26.98	7.34	2.691	8.00	1.39	-291.0	1.11	1.749	den	
1317	1.0	26.77	7.21	2.664	1.05	1.37	-316.5	1.04	1.731	4	
1320	1.3	26.67	7.21	2.667	1.15	1.37	-318.5	1.06	1.732	4	
1323	1.6	26.75	7.21	2.664	0.94	1.37	-320.3	1.03	1.732	4	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-20110915
 Sample ID: _____ Time Collected: 1323 Comments: VOL + MBA, MSR, VFA, TOL, dissolved metals, Alkalinity, Sulfide, Bi-RT, Arsenic
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal
~~When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal~~
0.041 x 0.035 x 67 + 0.25 = 0.35 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 550 MPS / 0042823 AF

Turbidimeter - Model/Serial #: HACH 2100 Q / 11020007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		09/28/11	0855	25.37	8.203	7.39/8.20	90.0/100.0	P F
CAL ICV CCV		"	1430	27.00	7.000	7.79	98.7	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		09/28/11	0908	1413	8809	03-2012	1.093/1.48	P F
CAL ICV CCV		"	1439	"	"	"	1.422	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		09/28/11	0859	4.0	2002034	01-2012	4.05/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	7.02/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.07/10.00	P F
CAL ICV CCV			1433	"	"	"	4.13	P F
CAL ICV CCV				"	"	"	6.89	P F
CAL ICV CCV				"	"	"	9.92	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		09/28/11	0912	240 @ 25	2244	03-2015	241.2/240.0	P F
CAL ICV CCV		"	1441	"	"	"	238.1	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		09/28/11	10.5	P F
CAL ICV CCV		"	10.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		09/28/11	17.1	P F
CAL ICV CCV		"	21.0	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		09/28/11	106	P F
CAL ICV CCV		"	101	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		09/28/11	327	P F
CAL ICV CCV		"	780	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 09/28/11 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geo pump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Hevon

Time @ Start of Purging: 1114 Time @ End of Purging: _____ Total Purging Time: 16 min. Depth of Pump or Intake Tubing: 52.0 ft. (BTOC)

Water Level: 5.11 ft. BTOC Total Well Depth: 57 ft. BLS Reference: _____ Well diameter: 6 in. Volume in well: 88.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1114	Start	26.64	7.46	2.480	5.89	1.27	-284.7	2.14	1.610	clear	
1124	1.0	26.46	7.25	2.471	1.74	1.27	-272.8	0.68	1.606	"	
1127	1.3	26.44	7.27	2.470	1.17	1.27	-277.9	0.63	1.606	"	
1130	1.6	26.42	7.21	2.470	1.31	1.27	-274.9	0.59	1.605	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-20110928
 Sample ID: _____ Time Collected: 1130 Comments: VOC + NDA, TOC, USE, VFA, Sulfides, Br & I, Arsenic, Alkalinity, Dissolved Metals, BHC, VCOA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 67 + 0.25 = 0.35 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO2724 Task: 38 Date: 09/28/11 Sampled By: J. Barthelt

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) VSI 556 MPS Water Level Meter: Heron

Time @ Start of Purging: 1030 Time @ End of Purging: 1047 Total Purging Time: 17 min. Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.24 ft BTOC Total Well Depth: 42 ft BLS Reference: — Well diameter: 6 in. Volume in well: 61.7 gal
 Screens: 35-42 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1030	Start	26.53	7.19	2.707	4.97	1.39	-210.3	2.04	1.748	clear	
1040	1.0	26.33	7.11	2.487	1.27	1.28	-277.0	0.82	1.617	"	
1044	1.4	26.45	7.11	2.461	1.00	1.26	-280.0	0.74	1.599	"	
1047	1.7	26.44	7.11	2.454	1.01	1.26	-284.3	0.66	1.595	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007 - 038.5 - 20110928
 Sample ID: _____ Time Collected: 1047 Comments: VOLTA, TOC, MZE, VFA, Sulfide, Boron, Antons, Alkalinity, Dissolved Metals, DIL, VFA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 52 + 0.25 = 0.32 gal.

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 64K10614 AF

Turbidimeter - Model/Serial #: HAUT 2100A / 11020C007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		10/13/11	0643	23.65	8.466	8.90/8.47	105.0/102.0	P F
CAL ICV CCV		"	1410	25.87	8.279	8.15	100.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>10</u> NTU	Acceptance Criteria: +/- 10%		
CAL ICV CCV	10/13/11	10.7	P F
CAL ICV CCV	"	10.9	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		10/13/11	0652	1413	8809	03-2012	1.423/1.413	P F
CAL ICV CCV		"	1416	"	"	"	1.401	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>20</u> NTU	Acceptance Criteria: +/- 8%		
CAL ICV CCV	10/13/11	20.1	P F
CAL ICV CCV	"	20.8	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		10/13/11	0646	4.0	2002034	01-2012	4.14/4.00	P F
CAL ICV CCV		"	"	7.0	2002012	01-2012	6.95/7.00	P F
CAL ICV CCV		"	"	10.0	2101326	07-2012	9.98/10.00	P F
CAL ICV CCV		10/13/11	1412	"	"	"	4.11	P F
CAL ICV CCV		"	"	"	"	"	6.96	P F
CAL ICV CCV		"	"	"	"	"	10.01	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>100</u> NTU	Acceptance Criteria: +/- 6.5%		
CAL ICV CCV	10/13/11	97.8	P F
CAL ICV CCV	"	101	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		10/13/11	0654	240 @ 25	2244	03-2015	242.9/240.0	P F
CAL ICV CCV		"	1418	"	"	"	238.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>200</u> NTU	Acceptance Criteria: +/- 5%		
CAL ICV CCV	10/13/11	791	P F
CAL ICV CCV	"	784	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TR02724 Task: 38 Date: 10/13/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 0929 Time @ End of Purging: 0944 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 2.43 ft. BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. OCS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0929	Start	25.86	7.17	2.494	3.32	1.28	-290.1	0.50	1.622	clear	
0939	1.0	25.75	7.16	2.485	3.17	1.28	-291.8	0.24	1.616	"	
0941	1.2	25.75	7.16	2.485	1.56	1.28	-305.7	0.21	1.616	"	
0944	1.5	25.73	7.15	2.486	2.33	1.28	-315.1	0.20	1.616	4	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-20111013 Time Collected: 0944 Comments: VOL + NBA, MCL, VFA, TOC, ALC, Br & I, Anions,

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 47 \pm 0.25 = 0.32 \text{ gal}$

5ml Role, Soluble metals

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/13/11 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): VSI 550 MPS JB Purge Rate: 2011 gpm Water Quality Meter (Make & Model) VSI 550 MPS Water Level Meter: Selinst

Time @ Start of Purging: 1007 Time @ End of Purging: 1022 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 2.36 ft. BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1007	Start	25.55	7.35	2.637	24.1	1.36	-303.5	1.31	1.713	clear	
1017	1.0	25.67	7.34	2.643	1.83	1.36	-298.4	0.20	1.718	"	
1019	1.2	25.70	7.35	2.643	1.44	1.36	-313.7	0.18	1.718	"	
1022	1.5	25.57	7.34	2.647	1.69	1.36	-304.8	0.21	1.720	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

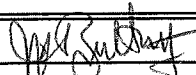
Sample ID: LC34-RW0008-052.0-20111013 Time Collected: 1022 Comments: VOC+NBΔ, M92, VFA, TOC, Aik, Sr by I, AMIons, sulfide, soluble metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 $0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$

Project: <u>V34</u>	Date: <u>10/25/11</u>
Project No.: <u>TRO2F2A</u>	Task No.: <u>3B</u>
Contractors: <u>-</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0700: J. Bartlett and R. Donahue at office. Calibrate Instruments (ICV). Load vehicle, travel to site.
0900: Onsite. Begin sampling. For details, refer to monitoring well sampling forms.
1215-1245: Lunch.
1530: End sampling. Leave site.
1600: Pack samples for shipment. Complete ROC.
1630: Calibrate Instruments (CCV) end of ops.
1700: End of day.

Plans/Future Activities


 10/25/11
Signature/Date

Project: <u>LC34</u>	Date: <u>10/26/11</u>
Project No.: <u>TR0272-A</u>	Task No.: <u>38</u>
Contractors: <u>---</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0715: J. Bartlett and R. Donahue at office. Calibrate instruments - (ICV). Load vehicle. Travel to site.
0830: On site. Begin sampling. For details, refer to Monitoring well sampling - forms.
1145 - 1215 = lunch.
1430: End sampling. Clean site pour 10W into drum. Travel to office.
1500: At office pack samples for shipment. Complete COC. Calibrate instruments (CCV).
1630: Ship samples via FedEx.
1700: End of day.

Plans/Future Activities

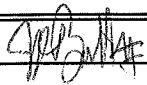
 10/26/11
Signature/Date

Project: <u>LC34</u>	Date: <u>10/27/11</u>
Project No.: <u>TR0272A</u>	Task No.: <u>38</u>
Contractors: <u>-</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0730: J. Bartlett at office. Calibrate instruments (ICV). Load vehicle, Travel to site.
- Pick up new NASA beeper.
- MGPU biosphere electrical reading. (252074 kWh)
0915: at site. Begin sampling. For details, refer to monitoring well sampling forms.
1200-1230: Lunch.
1230: Perform O&M on recirculation trailer.
1300: Pour 1DW into drum on-site. Sampled 1DW:
sampled: LC34-1DW-185407-20111027 @ 1300
sampled: LC34-1DW-183866-20111027 @ 1315
1330: Travel to HMF North site to drop 1DW samples with mobile lab (KB labs) for analysis.
1345: Drop 1DW samples off with mobile lab. Travel to office.
1415: At office. Unload vehicle. Calibrate instruments (CCV). Fill out DC. Pack samples for shipment via FedEx.

Plans/Future Activities

 10/27/11
Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MP5 / 091101399

Turbidimeter - Model/Serial #: HACH 21002 / 11020007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	0706	22.06	8.611	8.85/8.61	102.6/100.0	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1635	23.79	8.502	8.277	98.3	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	10.6	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	10.0	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	0717	1.413	8809	03-2012	1.512/1.413	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1647	"	"	"	1.427	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	20.1	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	22.7	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	0710	4.0	2002034	01-2012	4.06/4.00	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	"	7.0	2002012	01-2012	6.94/7.00	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	"	10.0	2101326	07-2012	10.12/10.02	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1639	"	"	"	6.05	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	"	"	"	"	6.85	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	"	"	"	"	6.97	P F

41 - 100 NTU	Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	101	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	102	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	0720	229 @ 25	1061713	06-2012	215.2/229.0	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1648	"	"	"	228.1	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std <u>200</u> NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		10/25/11	206	P F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	207	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: L034

Project #: TRO272A (8136)

Field Personnel: Rachel Donahue

Water Quality Meter - Model/Serial #: XSI 556 mps / 061128231F

Turbidimeter - Model/Serial #: Hach 200 Q / 10110000639A

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		10/25/11	7:14	22.12	8.027	4.35	109.17	P F
CAL ICV CCV		10/25/11	10:42	22.02	8.939	5.05	107.94	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	10/25/11	9.89	P F
CAL ICV CCV	10/25/11	9.15	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		10/25/11	7:20	1.413	8809	03/12	1.30	P F
CAL ICV CCV		10/25/11	10:33	1.413	8809	03/12	1.43	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV	10/25/11	14.9	P F
CAL ICV CCV	10/25/11	20.2	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		10/25/11	7:10	4.0	2002031	01/12	3.0	P F
CAL ICV CCV		10/25/11	7:17	7.0	2002012	01/12	7.33	P F
CAL ICV CCV		10/25/11	7:18	10.0	2101326	02/12	10.09	P F
CAL ICV CCV		10/25/11	10:29	4.0	2002031	01/12	4.00	P F
CAL ICV CCV		10/25/11	10:30	7.0	2002012	01/12	6.87	P F
CAL ICV CCV		10/25/11	10:32	10.0	2101326	02/12	9.92	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV	10/25/11	90.49	P F
CAL ICV CCV	10/25/11	102	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		10/25/11	7:30	229	1061713	10/30/12	238	P F
CAL ICV CCV		10/25/11	10:33	229	1061713	10/30/12	228	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV	10/25/11	199	P F
CAL ICV CCV	10/25/11	190	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 550 MPS / 09101399

Turbidimeter - Model/Serial #: 4ACIT 21002 / 11020007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>10/26/11</u>	<u>0717</u>	<u>23.60</u>	<u>8.482</u>	<u>75/8.48</u>	<u>88.5/77.9</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1628</u>	<u>23.77</u>	<u>8.450</u>	<u>7.32</u>	<u>86.6</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10/26/11</u>	<u>10.3</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>"</u>	<u>10.8</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>10/26/11</u>	<u>0726</u>	<u>1413</u>	<u>8809</u>	<u>03-2012</u>	<u>1.437/1.413</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1622</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>1.361</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10/26/11</u>	<u>20.3</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>"</u>	<u>20.3</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>10/26/11</u>	<u>0720</u>	<u>4.0</u>	<u>2002034</u>	<u>01-2012</u>	<u>4.10/4.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>"</u>	<u>7.0</u>	<u>2002012</u>	<u>01-2012</u>	<u>6.89/7.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>"</u>	<u>10.0</u>	<u>2101326</u>	<u>07-2012</u>	<u>10.15/10.00</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1615</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>9.10</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>6.91</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>9.97</u>	<u>P</u> <u>F</u>

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10/26/11</u>	<u>100</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>"</u>	<u>100</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>10/26/11</u>	<u>0730</u>	<u>229 @ 25</u>	<u>1061713</u>	<u>06-2012</u>	<u>226.3/229.0</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>		<u>"</u>	<u>1624</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>227.9</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>								<u>P</u> <u>F</u>

>100 NTU	Date	Reading (NTU)	Pass or Fail
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>10/26/11</u>	<u>79.8</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>	<u>"</u>	<u>77.8</u>	<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>
<u>CAL</u> <u>ICV</u> <u>CCV</u>			<u>P</u> <u>F</u>

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Fail on CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: IR L034 Project #: TR0212A Field Personnel: Rachel Donahue

Water Quality Meter - Model/Serial #: YSI 576 MPS 10642823 AF Turbidimeter - Model/Serial #: Hach 2100Q/101100006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
							Acceptance Criteria: +/- 0.3mg/L	
CAL ICV CCV		10/26/11	7:34	23.57	8.402	8.402	99.25	P F
CAL ICV CCV				23.00	8.507	8.507	99.25	P F
CAL ICV CCV		10/26/11	10:18	23.82	8.498	8.497	99.3	P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std 10 NTU			
			Acceptance Criteria: +/- 10%
CAL ICV CCV	10/26/11	10.1	P F
CAL ICV CCV	10/26/11	9.9	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
								Acceptance Criteria: +/- 5%
CAL ICV CCV		10/26/11	8:00	1.913	8809	03/12	1.388	P F
CAL ICV CCV		10/26/11	10:15	1.913	8809	03/12	1.410	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std 20 NTU			
			Acceptance Criteria: +/- 8%
CAL ICV CCV	10/26/11	20.2	P F
CAL ICV CCV	10/26/11	19.9	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
								Acceptance Criteria: +/- 0.2 SU
CAL ICV CCV		10/26/11	7:53	4.0	2002034	01/12	3.99	P F
CAL ICV CCV		10/26/11	7:55	7.0	2002032	01/12	7.05	P F
CAL ICV CCV		10/26/11	7:57	10.0	2002034	01/12	10.04	P F
CAL ICV CCV		10/26/11	10:11	4.0	2002034	01/12	4.11	P F
CAL ICV CCV		10/26/11	10:12	7.0	2002032	01/12	6.95	P F
CAL ICV CCV		10/26/11	10:14	10.0	2002034	01/12	9.86	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std 100 NTU			
			Acceptance Criteria: +/- 6.5%
CAL ICV CCV	10/26/11	98.3	P F
CAL ICV CCV	10/26/11	10.5	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
								Geosyntec Acceptance Criteria: +/- 5%
CAL ICV CCV		10/26/11	7:59	229	1061713	01/30/12	229.7	P F
CAL ICV CCV		10/26/11	10:07	229	1061713	01/30/12	229.7	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std 200 NTU			
			Acceptance Criteria: +/- 5%
CAL ICV CCV	10/26/11	217	P F
CAL ICV CCV	10/26/11	211	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 Comments: _____

CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 09D101399

Turbidimeter - Model/Serial #: HACH 2100Q / 11020C 007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/- 0.3mg/L		
CAL ICV CCV		10/27/11	0739	23.20	8.574	7.27/8.55	85.1/100.0	P F
CAL ICV CCV		"	1420	26.12	8.399	8.30	102.4	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
							Acceptance Criteria: +/- 5%	
CAL ICV CCV		10/27/11	0728	1413	9809	03-2012	6.370/1413	P F
CAL ICV CCV		"	1436	7/0	"	"	6410	P F
CAL ICV CCV				10.0				P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
							Acceptance Criteria: +/- 0.2 SU	
CAL ICV CCV		10/27/11	0742	4.0	2002039	01-2012	4.04/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	6.88/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.14/10.00	P F
CAL ICV CCV			1432				4.08	P F
CAL ICV CCV							6.99	P F
CAL ICV CCV							9.94	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
							Geosyntec Acceptance Criteria: +/- 5%	
CAL ICV CCV		10/27/11	0751	229 @ 25	1001713	06-2012	230.7/229.0	P F
CAL ICV CCV		"	1438	"	"	"	231.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 10%	
CAL ICV CCV	10	10/27/11	10.2	P F
CAL ICV CCV	"	"	11.0	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 8%	
CAL ICV CCV	20	10/27/11	20.1	P F
CAL ICV CCV	"	"	21.3	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 6.5%	
CAL ICV CCV	100	10/27/11	100	P F
CAL ICV CCV	"	"	104	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 5%	
CAL ICV CCV	200	10/27/11	201	P F
CAL ICV CCV	"	"	209	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: J. BarHolt

Station (Well ID): RW 0007 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 0905 Time @ End of Purging: 0923 Total Purging Time: 18 min. Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 3.39 A.BTOC Total Well Depth: 42 A.BLS Reference: — Well diameter: 6 in. Volume in well: 61.7 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 35-42 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0905	Start	24.85	7.11	1.217	24.6	0.60	-255.6	2.43	0.791	clear	—
0915	1.0	25.28	7.06	1.215	0.86	0.60	-306.1	1.48	0.790	"	
0919	1.4	25.28	7.06	1.220	0.61	0.61	-309.2	1.34	0.793	"	
0923	1.8	25.32	7.04	1.221	0.62	0.61	-313.7	1.19	0.794	"	

Flow cell turned on side during sampling may be cause for higher than normal D.O.

Fail DO CCV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-2011 10 26
 Sample ID: _____ Time Collected: 0923 Comments: VOC + uBA, VFA, Br & I, TOL, SulAde, MEE, Anions, Alk., Dissolved Metals, Dhc & VerA.
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 47 + 0.25 = 0.32 gal
(MS/MSD - VFA)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/26/2011 Sampled By: J. Barrett

Station (Well ID): IW0002I Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON
Time @ Start of Purging: 1045 Time @ End of Purging: 1100 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 027.5 ft. (BOC)
Water Level: 3.47 A.BOC Total Well Depth: 30 A.BLS Reference: — Well diameter: 2 in. Volume in well: 4.89 gal
SCREEN: 25-30 A.BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1045	Start	25.88	7.50	0.619	73.7	0.30	-212.5	1.32	0.399	clear	—
1055	1.0	26.01	7.00	0.744	13.0	0.26	-292.4	0.79	0.405	"	
1057	1.2	26.02	6.99	0.760	9.90	0.37	-294.9	0.65	0.495	"	
1100	1.5	26.04	6.99	0.780	9.47	0.38	-290.7	0.52	0.508	"	

Fail DO CCV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0002I - 027.5 - 201110
Sample ID: _____ Time Collected: 1100 Comments: Vol + nBA, VFA, Brk E, TOC, sulfide, MEE, Anions, Alk., Dissolved Metals.
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 35 + 0.25 = 0.30 gal (MS / MSD - Brk E)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/26/2011 Sampled By: J. Bartlett

Station (Well ID): IW00020 Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST DURHAM / HERON

Time @ Start of Purging: 1217 Time @ End of Purging: 1232 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 037.5 ft. (BTOC)

Water Level: 4.81 A.BTOC Total Well Depth: 40 A.BLS Reference: _____ Well diameter: 2 in. Volume in well: 6.5 gal

SCREEN: 35-40 A.BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1217	Start	26.66	6.42	1.916	4.52	0.97	-198.4	2.38	1.242	clear	—
1227	1.0	26.57	6.92	2.195	2.02	0.12	-301.9	0.73	1.435	"	
1229	1.2	26.56	6.88	2.247	1.29	1.15	-279.5	0.70	1.466	"	
1232	1.5	26.50	6.92	2.294	1.54	1.17	-311.7	0.61	1.402	"	

Fail DO cell

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ±0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW00020-037.5-20111026
 Sample ID: _____ Time Collected: 1232 Comments: VOL+IBA, VFA, Br⁻, F⁻, TOC, SULFIDE, MEG, Anions,

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal Aik., Dissolved Metals.

When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

$$0.041 \times 0.035 \times 4540.25 = 0.31 \text{ gal}$$

(MS / MSD) - TOC)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0001A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (___ Teflon ___ SS ___ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM HERON

Time @ Start of Purging: 9:37 Time @ End of Purging: 9:52 Total Purging Time: 15 min. Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 2.78 H.BTOC Total Well Depth: 26 H.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.5 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 23-26 H.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
9:37	Start	-	-	-	-	-	-	-	-	-	
9:47	1	25.53	7.23	0.857	3.39	0.42	-139.0	0.54	0.557	clear	
9:49	1.2	25.53	7.25	0.858	1.99	0.42	-141.4	0.63	0.558	clear	
9:52	1.4	25.54	7.24	0.858	1.73	0.42	-145.9	0.46	0.558	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001A-024.5-20111025
 Sample ID: _____ Time Collected: 9:55 Comments: VOL + nBA, VFA, Br & F, TOC, Sulfide, M²⁺, Anions, Alk., Dissolved Metals.
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)=0.328 gal
30 0.25
(MS/MSD - Sulfide)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0001B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM HERON

Time @ Start of Purging: 10:34 Time @ End of Purging: 10:47 Total Purging Time: 13 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 2.89 ft. BTOC Total Well Depth: 33 ft. BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.7 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>10:34</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>10:43</u>	<u>0.9</u>	<u>25.84</u>	<u>6.98</u>	<u>2.328</u>	<u>0.82</u>	<u>1.19</u>	<u>-168.1</u>	<u>0.94</u>	<u>1.515</u>	<u>clear</u>	
<u>10:45</u>	<u>1.8</u>	<u>25.81</u>	<u>7.02</u>	<u>2.355</u>	<u>0.93</u>	<u>1.21</u>	<u>-167.6</u>	<u>0.55</u>	<u>1.533</u>	<u>clear</u>	
<u>10:47</u>	<u>2.7</u>	<u>25.83</u>	<u>7.03</u>	<u>2.372</u>	<u>0.70</u>	<u>1.22</u>	<u>-175.0</u>	<u>0.39</u>	<u>1.543</u>	<u>clear</u>	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34 - BW0001B - 031.5 - 201110 25 Time Collected: 10:55 Comments: VOC + nBA, VFA, Br & F, TOC, Sulfide, MEE, Anion, Alk., Dissolved Metals.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.349 gal

(MS/MSD - VOC)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: Rachael Donahue

Station (Well ID): BW0001C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 11:21 Time @ End of Purging: 11:35 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 4.28 H.BTOC Total Well Depth: 40 H.BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 0.8 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

SCREEN: 37-40 H.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
11:21	Start										
11:31	1	25.50	7.09	2.273	1.54	1.16	-268.10	0.10	1.488	clear	
11:33	1.2	25.53	7.08	2.359	0.97	1.21	-256.0	0.10	1.538	clear	
11:35	1.4	25.45	7.07	2.383	0.82	1.22	-274.1	0.10	1.551	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001C - 038.5 - 20111025
Sample ID: _____ Time Collected: 11:41 Comments: VOC to BA, VFA, Br & I, TOC, Sulfide, MEE, Anions, Alk, Dissolved Metals, Dhc & rca. (MS/MSD - MEE)
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.367 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0001D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON
 Time @ Start of Purging: 14:22 Time @ End of Purging: 14:36 Total Purging Time: 14 min. Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)
 Water Level: 1.14 3.74 H.B.TOC Total Well Depth: 47 H.B.LS Reference: _____ Well diameter: 3/4 in. Volume in well: 0.9 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 44-47 H.B.LS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
14:22	Start	-	-	-	-	-	-	-	-	-	
14:32	1	25.67	7.09	2.761	1.14	1.43	-278.1	0.33	1.794	clear	
14:34	1.2	25.64	7.11	2.759	0.91	1.43	-296.8	0.34	1.794	clear	
14:36	1.4	25.61	7.10	2.757	4.40	1.42	-30.7	0.35	1.742	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001D - 045.5 - 201110 ²⁵
 Sample ID: _____ Time Collected: 14:40 Comments: VOC + nBA, VFA, Br & I, TOC, sulfide, MSE,
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal Antom, Alk., Dissolved Metals.
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.38 gal (MS / MSD - Antom)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/26/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0002A Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 9:33 Time @ End of Purging: 9:47 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 824.5 ft. (BTOC)

Water Level: 3.36 A.BTOC Total Well Depth: 26 A.BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 0.5 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 23-26 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
9:33	Start	—	—	—	—	—	—	—	—	—	
9:43	1.0	25.78	7.20	1.272	4.71	0.63	-186.6	0.25	0.829	clear	
9:45	1.2	25.77	7.19	1.292	3.95	0.64	-189.1	0.26	0.840	clear	
9:47	1.4	25.76	7.19	1.299	2.46	0.65	-184.2	0.31	0.845	clear	

DO Failed COV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002A - 024.5 - 20111026
 Sample ID: _____ Time Collected: 09:50 Comments: DOC+nBA, VFA, DnI, TOC, M2E
 When using 3/16-in. ID tubing EV= ((0.041)(0.035x tubing length))+(flow thru vol.)= _____ gal
 When using ¼-in. ID tubing EV=(0.0026x tubing length)+(flow thru vol.)= 0.331 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/24/2011 Sampled By: Rachael Donahue

Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/HERON DURHAM

Time @ Start of Purging: 8:53 Time @ End of Purging: 9:07 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 3.66 A.BTOC Total Well Depth: 33 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.7 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

SCREEN: 30-33 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
8:53	Start	—	—	—	—	—	—	—	—	—	
9:03	1.0	25.47	7.31	1.207	3.91	0.60	-234.7	0.30	0.184	clear	
9:05	1.2	25.47	7.33	1.200	4.23	0.59	-226.5	0.31	0.178	clear	
9:07	1.4	25.46	7.34	1.192	3.23	0.59	-236.5	0.35	0.174	clear	

DO failed cell

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002B - 031.5 - 2011 10 24
 Sample ID: _____ Time Collected: 9:10 Comments: VOC + PAH, VFA, Br & I, TOC, MEE
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.3788 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/28/2011 Sampled By: Rachel Dinahee

Station (Well ID): BW0002C Purge Method: (Pump) Bailer Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM/HERON

Time @ Start of Purging: 10:05 Time @ End of Purging: 10:19 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 038.5 ft. (BOC)

Water Level: 3.72 H.B.TOC Total Well Depth: 40 H.B.LS Reference: — Well diameter: 3/4 in. Volume in well: 0.8 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 SCREEN: 27-40 H.B.LS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
10:05	Start	—	—	—	—	—	—	—	—	—	
10:15	1.0	25.40	7.39	2.501	1.40	1.29	-322.9	0.16	1.629	clear	
10:17	1.2	25.39	7.38	2.570	1.42	1.29	-321.1	0.15	1.631	clear	
10:19	1.4	25.37	7.38	2.518	0.80	1.29	-330.1	0.15	1.637	clear	

DO failed @ 10:19

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002C-038.5-20111026
 Sample ID: _____ Time Collected: 10:25 Comments: VOL+nBA, VFA, Br&I, TOC, Sulfide, NH3, Anions, Alk.
 When using 3/16-in. ID tubing EV= ((0.041)(0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.361 gal
 (MS/MSD - Alk)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/26/2011 Sampled By: Rachel Dorahue

Station (Well ID): BW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 10:50 Time @ End of Purging: 11:04 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 4.20 A.BTOC Total Well Depth: 47 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.9 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 44-47 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>10:58</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>11:00</u>	<u>1</u>	<u>25.34</u>	<u>7.61</u>	<u>2.732</u>	<u>1.65</u>	<u>1.41</u>	<u>-333.0</u>	<u>0.79</u>	<u>1.777</u>	<u>clear</u>	
<u>11:02</u>	<u>1.2</u>	<u>25.32</u>	<u>7.58</u>	<u>2.744</u>	<u>1.22</u>	<u>1.42</u>	<u>-325.7</u>	<u>0.78</u>	<u>1.786</u>	<u>clear</u>	
<u>11:04</u>	<u>1.4</u>	<u>25.29</u>	<u>7.56</u>	<u>2.762</u>	<u>0.12</u>	<u>1.43</u>	<u>-337.7</u>	<u>0.77</u>	<u>1.797</u>	<u>clear</u>	

Defaired cell

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002D - 045.5 - 201110 20 Time Collected: 11:10 Comments: VOC+BA, VFA, Br & T, TOC, MS2

Sample ID: _____

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)=0.395 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: J. Buttlett

Station (Well ID): BW0003A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 1316 Time @ End of Purging: 1332 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 3.37 A.BTOC Total Well Depth: 26 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.5 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 23-26 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1316	Start	26.48	7.46	0.903	10.2	0.44	-199.4	1.68	0.582	clear	—
1326	1.0	26.27	7.27	0.854	1.97	0.42	-242.0	1.13	0.555	//	
1329	1.3	26.20	7.24	0.856	3.04	0.42	-237.4	1.04	0.556	u	
1332	1.6	26.36	7.23	0.853	1.84	0.42	-252.3	0.80	0.556	u	

Fail DO CCU

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003A - 024.5 - 20111026
Sample ID: _____ Time Collected: 1332 Comments: VOC + nBA, VFA, D- & I, TOC, M&E
When using 3/16-in. ID tubing EV=((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

0.0026 x 31 x 0.25 = 0.33 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/27/2011 Sampled By: J. Bartlett

Station (Well ID): BW0003B Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~ 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 0931 Time @ End of Purging: 0946 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 3.45 A.BTOC Total Well Depth: 33 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.7 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 30-33 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0931	Start	25.11	7.27	1.133	1.21	0.56	-234.9	4.16	0.735	clear	—
0941	1.0	25.16	7.30	0.954	1.69	0.47	-242.1	1.09	0.620	"	
0943	1.2	25.17	7.30	0.951	1.32	0.47	-238.1	0.97	0.619	"	
0946	1.5	25.16	7.30	0.945	1.40	0.46	-237.8	0.78	0.614	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003B - 031.5 - 20111027

Sample ID: _____ Time Collected: 0946 Comments: VOC+MBA, VFA, Br & I, TOC, MGC

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$$0.0026 \times 33 + 0.25 = 0.35 \text{ gal}$$

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/27/2011 Sampled By: J. Bartlett

Station (Well ID): BW0003C Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST (DURHAM) HERON

Time @ Start of Purging: 1039 Time @ End of Purging: 1055 Total Purging Time: 16 min. Depth of Pump or Intake Tubing: 038.5 ft. (BOC)

Water Level: 3.51 A.B.TOC Total Well Depth: 40 A.B.LS Reference: — Well diameter: 3/4 in. Volume in well: 0.8 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 37-40 A.B.LS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1039	Start	25.84	5.82	1.842	4.39	0.93	-243.2	3.49	1.187	clear	—
1049	1.0	25.62	7.18	1.749	2.81	0.88	-275.5	0.45	1.135	"	
1052	1.3	25.58	7.26	1.747	3.16	0.88	-277.0	0.40	1.134	"	
1055	1.6	25.57	7.32	1.753	2.66	0.88	-281.9	0.36	1.140	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003C - 038.5 - 201110 27
Sample ID: _____ Time Collected: 1055 Comments: VOC trBA, VFA, Bn & T, TOC, Sulfide, M&E, Anions, Alk., Dhc & rcrA.
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.0026 x 45 + 0.25 = 0.37 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/26/2011 Sampled By: J. Bartlett

Station (Well ID): BW0003D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 1354 Time @ End of Purging: 1409 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 13.39 H.BTOC Total Well Depth: 47 H.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.9 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

SCREEN: 44-47 H.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1354	Start	26.11	6.07	2.558	57.0	1.32	-225.0	8.06	1.670	clear	—
1404	1.0	25.80	6.34	2.565	10.8	1.32	-284.0	1.01	1.665	"	
1406	1.2	25.74	6.38	2.556	9.61	1.31	-284.3	0.85	1.662	"	
1409	1.5	25.82	6.43	2.612	6.81	1.35	-292.0	0.60	1.702	"	
Fail on CV.											

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002D - 045.5 - 20111026
Sample ID: _____ Time Collected: 1409 Comments: VOC + nBA, VFA, B, 4F, TOC, Mee

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.0026 \times 52 + 0.25 = 0.39 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~ 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM / HERON

Time @ Start of Purging: 0949 Time @ End of Purging: 1005 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 4.17 A.BTOC Total Well Depth: 57 A.BLS Reference: — Well diameter: 6 in. Volume in well: 83.7 gal

SCREEN: 47-57 A.BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0949	Start	24.89	7.30	2.614	7.46	1.35	-300.9	1.53	1.700	clear	—
0959	1.0	24.86	7.22	2.654	1.87	1.37	-320.8	0.45	1.725	"	
1002	1.3	24.87	7.22	2.657	1.67	1.37	-322.3	0.37	1.728	"	
1005	1.6	24.86	7.20	2.661	1.65	1.37	-322.9	0.31	1.730	"	

Fail DO CCU

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-2011026
 Sample ID: _____ Time Collected: 1005 Comments: VOC + nBA, VFA, Br & I, TOC, sulfate, MSE,

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using ¼-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$

(MS | MSD - VOC)

Anions, Alk., dissolved metals, DUC & ncrA.

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: Rachel Donahue

Station (Well ID): IW0002DI Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
 Time @ Start of Purging: 13:21 Time @ End of Purging: 13:35 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)
 Water Level: 4.55 A.BTOC Total Well Depth: 55 A.BLS Reference: — Well diameter: 2 in. Volume in well: 9.91 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 50-55 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>13:21</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>13:31</u>	<u>0.54</u>	<u>20.59</u>	<u>7.57</u>	<u>2.722</u>	<u>14.5</u>	<u>1.40</u>	<u>-303.1</u>	<u>0.29</u>	<u>1.772</u>	<u>clear</u>	
<u>13:33</u>	<u>1.2</u>	<u>20.51</u>	<u>7.58</u>	<u>2.726</u>	<u>9.39</u>	<u>1.41</u>	<u>-301.9</u>	<u>0.29</u>	<u>1.772</u>	<u>clear</u>	
<u>13:35</u>	<u>1.4</u>	<u>20.61</u>	<u>7.57</u>	<u>2.725</u>	<u>7.06</u>	<u>1.41</u>	<u>-301.9</u>	<u>0.27</u>	<u>1.773</u>	<u>clear</u>	

DO failed 0.00

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0002DI - 052.5 - 20111026
 Sample ID: _____ Time Collected: 13:40 Comments: VOC+mBA, VFA, Br & I, TOC, Sulfide, MEE, Anions, Alk., Dissolved Metals.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.406 gal
(MS/MSD - Dissolved Metals)

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0001E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 13:40 Time @ End of Purging: 13:54 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 4.07 H.BTOC Total Well Depth: 54 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.1 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 51-54 H.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
13:40	Start	—	—	—	—	—	—	—	—	—	
13:50	1	25.88	7.49	2.681	1.20	1.38	-275.5	0.25	1.743	clear	
13:52	1.2	25.81	7.47	2.687	0.79	1.39	-277.6	0.21	1.746	clear	
13:54	1.4	25.83	7.48	2.689	0.48	1.39	-281.4	0.20	1.748	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001E - 052.5 - 2011 10 25
Sample ID: _____ Time Collected: 14:00 Comments: VOC+nBA, VFA, Br&I, TOC, Silicic, MRE, Arsenic, Alk., Dissolved Metals, DHC & vcrA.
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = 0.483 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/25/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0001F Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): GEOPUMP Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 12:55 Time @ End of Purging: 13:09 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 4.14 A.BTOC Total Well Depth: 61 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.2 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 58-61 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
12:55	Start										
13:05	1	25.64	7.33	2.651	0.91	1.37	-107.9	0.51	1.724	clear	
13:07	1.2	25.59	7.44	2.633	0.59	1.37	-202.0	0.36	1.732	clear	
13:09	1.4	25.55	7.49	2.670	1.40	1.38	-188.4	0.30	1.736	clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001F - 059.5 - 201110 25
Sample ID: _____ Time Collected: 13:15 Comments: VOC+nBA, VFA, Br & I, TOC, Pulpide, MSE, Anions, Alk., Dissolved Metals.
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.419 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: Rachel Donahue

Station (Well ID): BW0002E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM / HERON

Time @ Start of Purging: 12:13 Time @ End of Purging: 2:27 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)
 Water Level: 4.71 A.BTOC Total Well Depth: 54 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.1 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 51-54 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>12:13</u>	<u>Start</u>										
<u>12:23</u>	<u>1.0</u>	<u>26.15</u>	<u>7.79</u>	<u>2.633</u>	<u>2.25</u>	<u>1.36</u>	<u>-253.4</u>	<u>0.20</u>	<u>1.714</u>	<u>clear</u>	
<u>12:25</u>	<u>1.2</u>	<u>26.17</u>	<u>7.76</u>	<u>2.652</u>	<u>1.76</u>	<u>1.37</u>	<u>-258.2</u>	<u>0.20</u>	<u>1.726</u>	<u>clear</u>	
<u>12:27</u>	<u>1.4</u>	<u>26.09</u>	<u>7.77</u>	<u>2.657</u>	<u>1.83</u>	<u>1.37</u>	<u>-250.5</u>	<u>0.20</u>	<u>1.727</u>	<u>clear</u>	

DO failed cal

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002E - 052.5 - 201110 26
 Sample ID: _____ Time Collected: 12:30 Comments: VOC+BA, Brk F, TOC, MSE, VFA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.463 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/26/2011 Sampled By: Rachel Donahue
 Station (Well ID): BW0002F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM / HERON
 Time @ Start of Purging: 12:46 Time @ End of Purging: 13:00 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)
 Water Level: A.14 A.BTOC Total Well Depth: 61 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.2 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 58-61 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
12:46	Start	—	—	—	—	—	—	—	—	—	—
12:56	1.0	26.39	7.60	2.732	0.56	1.41	-273.1	3.5	1.776	clear	
12:58	1.2	26.31	7.68	2.731	0.29	1.41	-229.1	0.24	1.776	clear	
13:00	1.4	26.29	7.69	2.734	0.40	1.41	-220.2	0.24	1.776	clear	

DO failed cell

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0002F - 059.5 - 201110 20
 Sample ID: _____ Time Collected: 13:00 Comments: VOC+uBA, VFA, Br&T, TOC, M&E.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.421 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/27/2011 Sampled By: J. Barlett

Station (Well ID): BW0003E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 1002 Time @ End of Purging: 1018 Total Purging Time: _____ Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 3.38 A.BTOC Total Well Depth: 54 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.1 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 51-54 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1002	Start	25.58	7.76	2.249	5.66	1.16	-184.5	3.70	1.483	clear	—
1012	1.0	25.28	6.63	2.603	2.05	1.24	-270.4	0.66	1.693	"	
1014	1.2	25.30	7.02	2.615	1.61	1.35	-285.3	0.52	1.701	"	
1016	1.4	25.28	7.09	2.621	1.77	1.35	-287.8	0.46	1.704	"	
1018	1.6	25.25	7.14	2.630	1.44	1.36	-288.4	0.42	1.710	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003E - 052.5-20111027
 Sample ID: _____ Time Collected: 1018 Comments: VOC+nDA, VFA, Br&F, TOC, M&C, Dhc & verA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal
0.0026 x 59 x 0.25 = 0.40 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/27/2011 Sampled By: J. Bartlett

Station (Well ID): BW0003F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 1119 Time @ End of Purging: 1134 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 3.97 A.BTOC Total Well Depth: 61 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.2 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 58-61 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1119	Start	26.22	5.84	2.600	8.02	1.34	-234.0	0.71	1.699	clear	—
1129	1.0	25.79	7.22	2.728	2.46	1.41	-277.9	0.40	1.773	"	
1131	1/2	25.88	7.27	2.728	1.29	1.41	-272.8	0.37	1.774	"	
1134	1.5	25.95	7.32	2.733	1.37	1.41	-287.1	0.34	1.776	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003F - 059.5 - 20111027
Sample ID: _____ Time Collected: 1134 Comments: VOC + PA, VFA, B & I, TOC, Sulfide, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.0026 x 66 x 0.25 = 0.42 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0076 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM

Time @ Start of Purging: 1428 Time @ End of Purging: 1502 Total Purging Time: 34 min. Depth of Pump or Intake Tubing: 075.0 ft. (BTOC)

Water Level: 4.26 A.BTOC Total Well Depth: 80 A.BLS Reference: — Well diameter: 2 in. Volume in well: 13.0 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 70-86 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1428	Start	26.89	7.34	2.555	186	1.31	-216.7	0.40	1.659	cloudy	
1438	1.0	26.01	7.38	2.568	117	1.32	-215.2	0.09	1.670	"	
1443	1.5	26.58	7.43	2.579	86.3	1.33	-209.7	0.08	1.677	"	
1448	2.0	26.76	7.45	2.584	62.6	1.33	-209.4	0.07	1.681	"	
1453	2.5	26.87	7.43	2.592	44.1	1.33	-204.0	0.06	1.685	"	
1458	3.0	26.97	7.45	2.599	40.7	1.34	-202.3	0.06	1.689	"	
1500	3.2	27.00	7.44	2.601	39.8	1.34	-196.4	0.06	1.691	"	
1502	3.4	27.01	7.43	2.601	38.7	1.34	-199.5	0.07	1.691	"	

turbidity not lowering -
 ±5 NTU.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ±0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0076 - 075.0 - 20111025
 Sample ID: _____ Time Collected: 1502 Comments: VOC + BA, VFA, Borate, TOC, Meq, Dissolved Metals
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal
0.0026 x 85 + 0.25 = 0.47 gal

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): FW0067D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 1145 Time @ End of Purging: 1202 Total Purging Time: 17 min. Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 3.89 A.BTOC Total Well Depth: 43 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.86 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 38-43 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1145	Start	25.93	7.59	2.627	127	1.35	-229.9	1.30	1.707	cloudy	—
1155	1.0	26.13	7.64	2.624	23.5	1.35	-242.0	0.13	1.706	clear	
1158	1.3	26.97	7.64	2.626	14.1	1.35	-264.2	0.10	1.702	"	
1200	1.5	25.97	7.57	2.617	8.42	1.35	-252.4	0.10	1.701	"	
1202	1.7	26.04	7.51	2.614	7.28	1.35	-244.9	0.09	1.699	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - FW0067D - 040.5 - 20111025
Sample ID: _____ Time Collected: 1202 Comments: VOC + BA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 48 + 0.25 = 0.32 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0067D1 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~ 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 1257 Time @ End of Purging: 1336 Total Purging Time: 39 min Depth of Pump or Intake Tubing: 068.0 ft. (BOC)

Water Level: 3.4 A.B.TOC Total Well Depth: 73 A.B.LS Reference: — Well diameter: 3/4 in. Volume in well: 1.46 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

SCREEN: 63-73 A.B.LS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1257	Start	25.90	7.59	2.604	167	1.34	-116.9	1.52	1.704	cloudy	
1307	1.0	26.22	7.54	2.667	610	1.37	-143.0	0.29	1.734	"	
1317	2.0	25.51	7.50	2.656	110	1.37	-142.5	0.19	1.727	"	
1327	3.0	25.66	7.51	2.654	62.5	1.37	-148.6	0.15	1.725	"	
1329 1332	3.2 3.5	25.68 25.68	7.50	2.665	71.2	1.37	-151.0	0.14	1.730	"	
1334	3.7	25.87	7.50	2.657	75.8	1.37	-151.2	0.13	1.727	"	
1336	3.9	25.87	7.50	2.658	74.8	1.37	-141.5	0.13	1.728	"	
											turbidity not lowering. ±5 NTU

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0067D1 - 068.0 - 20111025 1336 Comments: VOL + nBA.

Sample ID: _____ Time Collected: _____

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 78 + 0.25 = 0.36 \text{ gal.}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0070D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 1045 Time @ End of Purging: 1100 Total Purging Time: 15 min. Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 2.86 A.BTOC Total Well Depth: 43 A.BLS Reference: --- Well diameter: 3/4 in. Volume in well: 0.86 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 38-43 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1045	Start	26.12	7.44	2.525	62.3	1.30	-228.2	0.77	1.653	clear	
1055	1.0	26.17	7.64	2.670	8.25	1.38	-273.3	0.08	1.735	"	
1057	1.2	26.15	7.64	2.674	5.81	1.38	-274.8	0.08	1.738	"	
1100	1.5	26.16	7.64	2.672	4.27	1.38	-280.9	0.08	1.737	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0070D-040.5-201025
Sample ID: _____ Time Collected: 1100 Comments: VOC + nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 48 + 0.25 = 0.32 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0070D1 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 1109 Time @ End of Purging: 1124 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)

Water Level: 3.36 A.BTOC Total Well Depth: 75 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.5 gal.
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 65-75 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1109	Start	26.28	7.57	2.159	70.5	1.11	-211.6	2.08	1.448	cloudy	—
1119	1.0	26.27	7.55	2.642	13.1	1.36	-192.8	0.11	1.720	clear	
1121	1.2	26.08	7.55	2.677	8.83	1.38	-185.3	0.11	1.741	"	
1124	1.5	26.10	7.56	2.694	8.01	1.39	-185.1	0.10	1.749	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0070D1 - 070.0 - 20111025
Sample ID: _____ Time Collected: 1124 Comments: VOL + nBA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 80 + 0.25 = 0.36 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0071D Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~ 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST / DURHAM
HERON

Time @ Start of Purging: 0949 Time @ End of Purging: 1004 Total Purging Time: 15 min. Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 0.8 A.BTOC Total Well Depth: 43 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.80 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 38-43 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0949	Start	24.17	7.33	1.967	8.80	1.01	-202.4	1.44	1.301	Clear	-
0959	1.0	24.23	7.56	2.385	2.22	1.22	-216.1	0.18	1.550	"	
1002	1.3	24.26	7.55	2.388	1.24	1.23	-219.8	0.15	1.553	"	
1004	1.5	24.26	7.54	2.394	1.10	1.23	-221.9	0.12	1.556	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0071D - 040.5 - 20111025
Sample ID: _____ Time Collected: 1004 Comments: VOC + B.A.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using ¼-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 48 + 0.25 = 0.32 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TR02724 Task: 38 Date: 10/25/2011 Sampled By: J. Bartlett

Station (Well ID): IW0071D1 Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SOLINST/DURHAM
HERON

Time @ Start of Purging: 1011 Time @ End of Purging: 1026 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)

Water Level: 0.2 A.BTOC Total Well Depth: 75 A.BLS Reference: — Well diameter: 3/4 in. Volume in well: 1.5 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 65-75 A.BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1011	Start	24.36	7.65	2.026	31.4	1.06	-181.1	0.75	1.291	clear	—
1021	1.0	24.35	7.56	2.538	11.9	1.31	-154.6	0.11	1.650	"	
1023	1.2	24.32	7.56	2.545	7.62	1.31	-158.3	0.11	1.654	"	
1026	1.5	24.47	7.58	2.546	4.16	1.31	-160.6	0.09	1.655	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0071D1-070.0-20111025
Sample ID: _____ Time Collected: 1026 Comments: VOC + nBA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 80 = 0.25$
 $0.25 + 0.25 = 0.50 \text{ gal}$

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: TRO272A Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 10K101389 Turbidimeter - Model/Serial #: HACH 2100Q / 11020007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		11/10/11	0800	23.33	8.530	8.51/8.53	99.7/100.0	P F
CAL ICV CCV		"	1421	25.49	8.203	8.13	98.8	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		11/10/11	0818	1413	8809	03-2012	1.454/1.413	P F
CAL ICV CCV		"	1431	"	"	"	1.373	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		11/10/11	0806	4.0	2002034	01-2012	4.02/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	6.80/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.17/10.03	P F
CAL ICV CCV			1426				4.19	P F
CAL ICV CCV				"	"	"	9.00	P F
CAL ICV CCV							9.00	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		11/10/11	0826	229 @ 25	1061713	00-2012	244.7/229.0	P F
CAL ICV CCV		"		"	"	"	224.1	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		11/10/11	10.6	P F
CAL ICV CCV		"	11.0	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		11/10/11	19.6	P F
CAL ICV CCV		"	20.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		11/10/11	100	P F
CAL ICV CCV		"	104	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std <u>200</u> NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		11/10/11	309	P F
CAL ICV CCV		"	381	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 11/10/11 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo pump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: _____

Time @ Start of Purging: 1044 Time @ End of Purging: 1059 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 5.40 ft. BTOC Total Well Depth: 57 ft. BIS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47-57 ft. BIS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1044	Start	25.13	7.45	2.596	178	1.34	-337.1	2.76	1.687	cloudy	
1054	1.0	25.12	7.44	2.589	2.56	1.33	-343.1	0.30	1.683	clear	
1056	1.2	25.09	7.43	2.588	1.68	1.33	-341.6	0.25	1.682	"	
1059	1.5	25.12	7.42	2.587	1.35	1.33	-349.2	0.21	1.681	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-2011110
 Sample ID: _____ Time Collected: 1059 Comments: VOLT w/BA, VFA, TOC, MZE, Dissolved Metals, Anions w/ Br & I, Alkalinity, Sulfide.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 62 + 0.25 = 0.34 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 11/10/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geo pump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1009 Time @ End of Purging: 1024 Total Purging Time: 15 min. Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)
 Water Level: 3.30 A. SSC Total Well Depth: 42 ft. BLS Reference: — Well diameter: 6 in. Volume in well: 61.7 gal.
 Screen: 35-42 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1009	Start	24.67	7.61	2.280	22.0	1.17	-308.0	2.55	1.485	clear	
1019	1.0	25.35	7.27	2.440	1.23	1.25	-331.3	0.27	1.586	"	
1021	1.2	25.33	7.27	2.442	0.92	1.25	-328.2	0.25	1.587	"	
1024	1.5	25.34	7.26	2.445	1.45	1.26	-332.5	0.21	1.589	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0007-038.5-20111110 Time Collected: 1024 Comments: VOL + nBA, VFA, TOL, MEE, Dissolved Metals, Anions w/ Br&F, Alkalinity, Sulfide.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = gal
0.041 X 0.035 X 47 + 0.25 = 0.32 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: TR0272-4 ^{JB} 1234 Project #: TR0272A Field Personnel: J. Barlett

Water Quality Meter - Model/Serial #: YSI 550MPS / 10K101389 Turbidimeter - Model/Serial #: HACH 2100Q / 101100006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		11/22/11	0929	24.21	8387	807/839	962/100.0	P F
CAL ICV CCV		"	1333	28.95	7.091	7.85	102.1	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		11/22/11	0946	1.413	8809	03-2012	1.409/1.413	P F
CAL ICV CCV		"	1350	"	"	"	1.376	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		11/22/11	0934	4.0	2002034	01-2012	4.36/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	6.71/7.00	P F
CAL ICV CCV				12.0	2101326	07-2012	10.41/10.00	P F
CAL ICV CCV			1343				3.99	P F
CAL ICV CCV				4	"	"	6.06	P F
CAL ICV CCV							9.09	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		11/22/11	0948	229 @ 25	1061713	06-2012	229.2/229.0	P F
CAL ICV CCV		"	1352	"	"	"	228.7	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV	10	11/22/11	9.49	P F
CAL ICV CCV	"	"	10.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV	20	11/22/11	20.1	P F
CAL ICV CCV	"	"	20.1	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV	100	11/22/11	100	P F
CAL ICV CCV	"	"	100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV	200	11/22/11	204	P F
CAL ICV CCV	"	"	209	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 Comments: _____

CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 88 Date: 11/22/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 550 MPS Water Level Meter: Durham

Time @ Start of Purging: 1039 Time @ End of Purging: 1054 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 3.72 ft. BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1039	Start	25.72	7.48	2.492	5.40	1.28	-301.8	3.64	1.619	clear	
1049	1.0	25.62	7.22	2.468	0.80	1.27	-549.6	0.19	1.604	"	
1051	1.2	25.61	7.21	2.465	0.47	1.27	-554.9	0.18	1.601	"	
1054	1.5	25.60	7.19	2.461	0.77	1.26	-538.8	0.15	1.598	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20111122
 Sample ID: _____ Time Collected: 1054 Comments: VOC + nBA, M&E, TOC, VFA, Br & I w/ Anions, Alkalinity, Dissolved Metals, Sulfide
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 $0.041 \times 0.035 \times 47 + 0.25 = 0.32 \text{ gal}$

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 11/22/11 Sampled By: J. Bartlett

Station (Well ID): RW000 B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durom

Time @ Start of Purging: Time @ End of Purging: 1130 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 5.94 ft. BTOC Total Well Depth: 57 ft. BGS Reference: Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screens 47-57 ft. BGS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1115	Start	25.81	7.51	2.478	5.07	1.27	-321.9	2.76	1.614	clear	
1125	1.0	25.55	7.32	2.582	0.80	1.33	-331.4	0.19	1.678	"	
1127	1.2	25.06	7.31	2.582	0.95	1.33	-344.3	0.16	1.678	"	
1130	1.5	25.74	7.31	2.583	0.79	1.33	-346.3	0.14	1.679	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW000B-052.0-2011122
 Sample ID: Time Collected: 1130 Comments: VOL + nBA, M₂, TOC, VFA, B₅ & 7⁻ Anions,

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = gal

$$0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$$

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 102101389

Turbidimeter - Model/Serial #: 4Act 21002 / 110202007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		12/15/11	0805	22.43	8.677	1000/8.68	115.2/1000	P F
CAL ICV CCV		"	1310	23.96	8.418	8.26	98.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		12/15/11	0822	1.413	8809	03-2012	1.421/1.413	P F
CAL ICV CCV		"	1334	"	"	"	1.415	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		12/15/11	0812	4.0	2002034	01-2012	4.08/4.00	P F
CAL ICV CCV				7.0	2002012	01-2012	6.96/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.27/10.04	P F
CAL ICV CCV			1326				4.11	P F
CAL ICV CCV				"	"	"	6.92	P F
CAL ICV CCV							10.02	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		12/15/11	0825	229 @ 25	1061713	06-2012	230.5/229.0	P F
CAL ICV CCV		"	1338	"	"	"	224.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		12/15/11	10.6	P F
CAL ICV CCV		"	10.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		12/15/11	20.2	P F
CAL ICV CCV		"	21.2	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		12/15/11	101	P F
CAL ICV CCV		"	104	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 300 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		12/15/11	398	P F
CAL ICV CCV		"	382	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

- 1. See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: TR6 277A Task: 38 Date: 12/15/11 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) X Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Gepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) Ysi 556 MPS Water Level Meter: Heron

Time @ Start of Purging: 1011 Time @ End of Purging: 1026 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 4.24 ft. BTOC Total Well Depth: 42 ft. BLS Reference: — Well diameter: 6 in. Volume in well: 61.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1011	Start	24.67	7.48	2.191	7.56	1.11	-217.7	2.03	1409	clear	
1021	1.0	25.04	7.20	2.055	1.55	1.05	-308.1	0.16	1.336	"	
1023	1.2	25.03	7.19	2.056	1.29	1.05	-311.1	0.14	1.337	"	
1026	1.5	25.00	7.18	2.064	0.99	1.05	-320.3	0.12	1.342	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20111215
 Sample ID: _____ Time Collected: 1026 Comments: VOC in BA, TOC, MEE, VFA, Sulfate, Dissolved Metals, Borate w/ Anions, Alkalinity, DOC & VFA.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.32 gal
 When using ¼-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 47 + 0.25 = 0.32 gal

Monitoring Well Sampling

Site: LL34 Project No.: TRO272A Task: 38 Date: 12/15/11 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MP3 Water Level Meter: Heron

Time @ Start of Purging: 1046 Time @ End of Purging: 1101 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 4.25 ft BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1046	Start	24.45	7.85	2.541	7.80	1.31	-257.5	5.57	1.652	clear/grey tint	
1056	1.0	24.58	7.46	2.548	1.22	1.31	-326.3	0.17	1.657	"	
1058	1.2	24.60	7.44	2.550	1.59	1.31	-329.6	0.15	1.658	"	
1101	1.5	24.60	7.42	2.551	1.37	1.31	-329.4	0.15	1.658	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LL34 - RW0008 - 052.0 - 20111215
 Sample ID: _____ Time Collected: 1101 Comments: VOLTA BA, TOC, MGC, VFA, SulAde, Dissolved Metals, Br & I w/ Anions, Alkalinity, Dinc & uenA.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.34 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 62 + 0.25 = 0.34 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TRO272A

Field Personnel: J. Barthelet

Water Quality Meter - Model/Serial #: YSI 556 MPS/05F1542 AC

Turbidimeter - Model/Serial # HAUH 210002/10110C006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		1/5/12	0915	18.47	9.371	8.03/9.37	85.7/100.0	P F
CAL ICV CCV		"	1100	24.51	8.340	8.02	103.3	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		1/5/12	9.56	P F
CAL ICV CCV		"	9.82	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/5/12	0920	1.413	9084	07-2012	1.608/1.413	P F
CAL ICV CCV		"	1132	"	"	"	1.352	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		1/5/12	20.7	P F
CAL ICV CCV		"	20.5	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		1/5/12	0918	4.0	2012159	04-2012	3.89/4.00	P F
CAL ICV CCV		"	"	7.0	2105403	04-2013	7.04/7.00	P F
CAL ICV CCV		"	"	10.0	2101366	07-2012	10.11/10.02	P F
CAL ICV CCV		"	1125	"	"	"	3.43	P F
CAL ICV CCV		"	"	"	"	"	6.83	P F
CAL ICV CCV		"	"	"	"	"	9.85	P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		1/5/12	101	P F
CAL ICV CCV		"	100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		1/5/12	0930	240±25	3354	06-2010	237.1/240.0	P F
CAL ICV CCV		"	1134	"	"	"	230.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		1/5/12	205	P F
CAL ICV CCV		"	273	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 38 Date: 1/5/12 Sampled By: J. Bortelt

Station (Well ID): RW0008 Purge Method: Ⓢump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Gro pump Purge Rate: 70.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1026 Time @ End of Purging: 1041 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 5.42 ft. BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1026</u>	<u>Start</u>	<u>22.27</u>	<u>7.48</u>	<u>2.402</u>	<u>2.89</u>	<u>1.24</u>	<u>-250.9</u>	<u>2.51</u>	<u>1.562</u>	<u>clear</u>	
<u>1036</u>	<u>1.0</u>	<u>22.94</u>	<u>7.37</u>	<u>2.419</u>	<u>0.67</u>	<u>1.25</u>	<u>-281.8</u>	<u>0.62</u>	<u>1.572</u>	<u>"</u>	
<u>1038</u>	<u>1.2</u>	<u>23.00</u>	<u>7.34</u>	<u>2.418</u>	<u>0.67</u>	<u>1.24</u>	<u>-282.2</u>	<u>0.61</u>	<u>1.572</u>	<u>"</u>	
<u>1041</u>	<u>1.5</u>	<u>22.96</u>	<u>7.26</u>	<u>2.420</u>	<u>0.80</u>	<u>1.25</u>	<u>-283.7</u>	<u>0.50</u>	<u>1.573</u>	<u>"</u>	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-20120105 Time Collected: 1041 Comments: VOL % nBA, MRE, TOC, VFA, Sm/Acid, Soluble Metals, Alkalinity, Br & I w/ Anions
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = 0.34 gal
 When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = gal
0.041 x 0.035 x 62 ft. = 0.34 gal

Monitoring Well Sampling

Site: LC34 Project No.: TRO272A Task: 38 Date: 1/5/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Veepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 536 MPS Water Level Meter: Solinst.

Time @ Start of Purging: 0944 Time @ End of Purging: 0959 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 4.41 ft. BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 35-42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0944	Start	22.53	7.06	1.410	27.8	0.70	-199.7	1.65	0.906	clear	
0954	1.0	22.99	7.11	1.328	2.71	0.66	-243.1	0.72	0.859	"	
0956	1.2	23.05	7.13	1.340	4.27	0.67	-248.5	0.67	0.974	"	
0959	1.5	23.15	7.11	1.395	2.97	0.90	-255.3	0.50	0.907	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007 - 038.5 - 2012 0105
 Sample ID: _____ Time Collected: 0959 Comments: Vol & nba, MEEs, VFA, TOC, Sulfide, Solinst Metals,

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.32 gal Alkalinity, Br & I w/ Arsenic
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

$0.041 \times 0.035 \times 47 \times 0.25 = 0.32 \text{ gal}$

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 550 MPS / 05F1542 AS

Turbidimeter - Model/Serial #: HACH 2100Q / 110206007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
						Acceptance Criteria: +/- 0.3mg/L		
CAL ICV CCV		1/26/12	0819	22.47	8.060	220/8.06	100.1/100.0	P F
CAL ICV CCV		"	1603	25.52	8.188	8.37	102.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
							Acceptance Criteria: +/- 5%	
CAL ICV CCV		1/26/12	0837	1.413	8809	03-2012	1.478/1.413	P F
CAL ICV CCV		"	1616	"	"	"	1.342	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
							Acceptance Criteria: +/- 0.2 SU	
CAL ICV CCV		1/26/12	0827	4.0	0110969	11-2012	4.24/4.00	P F
CAL ICV CCV				7.0	001860	08-2013	6.86/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.02/10.00	P F
CAL ICV CCV		1/26/12	1607	"	"	"	4.00	P F
CAL ICV CCV				"	"	"	6.98	P F
CAL ICV CCV				"	"	"	9.95	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
							Geosyntec Acceptance Criteria: +/- 5%	
CAL ICV CCV		1/26/12	0839	229 @ 25	1061713	06-2012	234.5/229.0	P F
CAL ICV CCV		"	1618	"	"	"	228.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 10%	
CAL ICV CCV		1/26/12	10.4	P F
CAL ICV CCV		"	10.8	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 8%	
CAL ICV CCV		1/26/12	19.9	P F
CAL ICV CCV		"	20.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 6.5%	
CAL ICV CCV		1/26/12	79.8	P F
CAL ICV CCV		"	105	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
			Acceptance Criteria: +/- 5%	
CAL ICV CCV		1/26/12	796	P F
CAL ICV CCV		"	785	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 88 Date: 1/26/12 Sampled By: J. Bertlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) X Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Gro pump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) Ysi 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1002 Time @ End of Purging: 1017 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.13 ft. BTOC Total Well Depth: 42 ft. BUS Reference: - Well diameter: 6 in. Volume in well: 61.7 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
SCREEN: 35-42 ft BUS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1002	Start	24.35	7.25	2.004	3.93	1.02	-242.9	2.23 3.43 ^{DB}	1.302	clear	
1012	1.0	24.69	7.23	1.982	0.95	1.01	-302.8	1.26	1.288	"	
1014	1.2	24.69	7.24	1.987	0.28	1.01	-304.9	1.18	1.293	"	
1017	1.5	24.49	7.23	1.991	0.83	1.01	-259.9	1.06	1.293	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-0385-20120126
 Sample ID: _____ Time Collected: 1017 Comments: VOC + nBA, TOC, MS₂, VFA, Bt I w/ Arsenic, Alkalinity, Dissolved Metals, Sulfate, Dhc, vcrA.
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = 0.32 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 47 + 0.25 = 0.32 gal.

Monitoring Well Sampling

Site: LC34 Project No.: TR0272A Task: 300 Date: 1/26/12 Sampled By: J. Bartlett
 Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) X Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 10.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1045 Time @ End of Purging: 1100 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)
 Water Level: 6.00 ft. BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal.
 Screen: 47-57 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1045	Start	24.57	7.41	2.368	1.88	1.21	-271.7	3.21	1.539	lt. gray	
1055	1.0	24.34	7.36	2.356	0.59	1.21	-252.0	0.94	1.531	clear	
1057	1.2	24.46	7.34	2.350	0.54	1.21	-259.9	0.87	1.528	"	
1100	1.5	24.48	7.36	2.350	0.59	1.21	-293.1	0.80	1.528	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.


LC34-RW0008-052.0-20120126
 Sample ID: _____ Time Collected: 1100 Comments: VOC + nBA, TOC, M&E, VFA, Br + I w/ Amions,
 When using 3/16-in. ID tubing $EV = ((0.041) (0.035 \times \text{tubing length})) + (\text{flow thru vol.}) = \underline{0.34} \text{ gal}$ Alkalinity, Dissolved Metals, Sulfide,
 When using 1/4-in. ID tubing $EV = (0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) = \underline{\hspace{2cm}} \text{ gal}$ Dhc, ucrA,
 $0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$

Project: <u>LL34</u>	Date: <u>2/14/12</u>
Project No.: <u>TR0272A</u>	Task No.: <u>38</u>
Contractors: <u>-</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>X</u> _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0800: J. Bartlett and D. Sizemore at office. Calibrate instruments (LCV). Load vehicle. Travel to site.
0900: On site. Perform O&M. Turn off system for sampling event.
0930: Begin sampling. For details refer to monitoring well sampling forms.
- pH probe reading out of range. Reset calibration of pH.
1200: D. Sizemore onsite. Recalibrate pH. Called Pine EMV. - confirmed malfunctioning pH probe. Order new YSI for pick up tomorrow.
1230: Lunch
1300: off site
1530: at office. pack coolers for shipment
1600: Calibrate instruments (LCV.) pack up YSI for shipment.
1700: end of day.

Plans/Future Activities

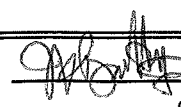
 2/14/12
 Signature/Date

Project: <u>LC34</u>	Date: <u>2/15/12</u>
Project No.: <u>100272A</u>	Task No.: <u>30</u>
Contractors: <u>—</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>X</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0730: At J. Gurnett at office. Load vehicle, travel to FedEx for YSI pickup at 8am.
0800: FedEx opens at 9am.
0900: pick up YSI, travel to site
1000: On site, D. Sizemore already on site. Calibrate YSI (ICV). Begin sampling for details, refer to monitoring well sampling forms.
1230: Lunch
1500: Off site. Travel to office
1530: Pack samples for shipment. Calibrate instruments (CCV).
1700: End of day.

Plans/Future Activities

 2/15/12
Signature/Date

Project: <u>LC34</u>	Date: <u>2/16/12</u>
Project No.: <u>TR0272A</u>	Task No.: <u>3B</u>
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0800: J. Bartlett at office. D. Sizemore at site. Calibrate instruments (ICV). Lead vehicle, travel to bagging station to meet C. Schmidt.
0900: C. Schmidt not going to be 1 hr late. J. Bartlett travel to LC34 site.
1000 0930: J. Bartlett begin collecting data logger data.
1015: J. Bartlett off site to meet C. Schmidt at bagging → MLPV stud.
1200: On site. Continue collecting data logger data
1315: Complete collecting data logger data. Collect IDW sample: LC34-IDW-185539-20120216 @ 1330.
1400: J. Bartlett off site. begin
1500: Pack coolers for shipment.

Plans/Future Activities

 2/16/12
 Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TR0 272A

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 550 MPS / 10 M 100 161

Turbidimeter - Model/Serial # HACH 2100Q / 11020C 007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	1005	22.67	8.627	10.51/8.63	1217/100.0	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1642	26.82	7.997	8.15	101.6	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	10.5	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	10.7	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	1018	1.413	9084	07-2012	1.402/1.413	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1653	"	"	"	1.405	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	20.3	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	21.6	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	1011	4.0	2106053	05-2013	4.05/4.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV				7.0	2105403	04-2013	6.99/7.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV				10.0	2101366	07-2012	9.98/10.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV			1645	"	"	"	4.08	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV				"	"	"	7.01	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV				"	"	"	10.00	<input checked="" type="checkbox"/> P <input type="checkbox"/> F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	100	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	101	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	1021	240 @ 25	3354	06-2016	239.3/240.0	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	1656	"	"	"	230.4	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV								<input type="checkbox"/> P <input type="checkbox"/> F

>100 NTU	Std 800 NTU	Date	Reading (NTU)	Pass or Fail
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		2/15/12	789	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input checked="" type="checkbox"/> CAL <input checked="" type="checkbox"/> ICV <input checked="" type="checkbox"/> CCV		"	812	<input checked="" type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F
<input type="checkbox"/> CAL <input type="checkbox"/> ICV <input type="checkbox"/> CCV				<input type="checkbox"/> P <input type="checkbox"/> F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: TRO272A

Field Personnel: A Bartlett

Water Quality Meter - Model/Serial #: YSI 550 MPS / 06D2138AL

Turbidimeter - Model/Serial #: HACH 2100R / 11020C007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		2/14/12	0807	20.77	8.950	8.96/8.95	100.1/99.9	P F
CAL ICV CCV		//	1617	26.50	8.040	7.46	96.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/14/12	0827	1.413	8809	03-2012	1.370/1.410	P F
CAL ICV CCV		//	1623	"	"	"	1.417	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		2/14/12	0810	4.0	0110969	11-2012	3.01/4.01	P F
CAL ICV CCV				7.0	7001860	03-2013	6.77/7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	9.35/10.00	P F
CAL ICV CCV			1619	"	"	"	5.36/4.00	P F
CAL ICV CCV				"	"	"	6.94	P F
CAL ICV CCV				"	"	"	8.35	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		2/14/12	0832	229 @ 25	1061713	07-2012	238.0/271.0	P F
CAL ICV CCV		//	1625	"	"	06-2012	222.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		2/14/12	10.5	P F
CAL ICV CCV		//	12.7	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		2/14/12	19.9	P F
CAL ICV CCV		//	21.2	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		2/14/12	100	P F
CAL ICV CCV		//	105	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		2/14/12	302	P F
CAL ICV CCV		//	399	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: LC34 Project #: R0272 Field Personnel: D. Sidmore

Water Quality Meter - Model/Serial #: YSI 556 04K16614 Turbidimeter - Model/Serial #: HACH 2100 1122664

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		2/14/12	1106	20.54	9.009	7.59-9.00	100.6	P F
CAL ICV CCV		2/14/12		23.68	8.406	863	100.5	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
70		2/14/12	19.5-20	P F
		2/14/12	10.5	P F
				P F
				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		2/14/12	1101	1.403	8809	3/12	1.124-1.403	P F
CAL ICV CCV		2/14/12	1636	3			1390	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
60		2/14/12	29-100	P F
		2/14/12	90.5	P F
				P F
				P F
				P F
				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		2/14/12	1053	4	0110969	11/12	4.29-4.02	P F
CAL ICV CCV			1055	7	1021860	8/13	7.14-7.03	P F
CAL ICV CCV			1056	7	2101326	7/12	10.12-10.00	P F
CAL ICV CCV		2/14/12	1632				9.19	P F
CAL ICV CCV			1633				7.01	P F
CAL ICV CCV			1634				10.05	P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
				P F
				P F
				P F
				P F
				P F
				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		2/14/12	1109	240025	3354	6/16	237.9-240.9	P F
CAL ICV CCV		2/14/12	1631				235.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
				P F
				P F
				P F
				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration Comments: _____
 ICV - Initial Calibration Verification _____
 CCV - Continuing Calibration Verification _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: T120272 Field Personnel: P. Szemack

Water Quality Meter - Model/Serial #: YSI 556 04K16614 Turbidimeter - Model/Serial #: Hach 21009 1122664

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		<u>2/15/12</u>	<u>843</u>	<u>21.16</u>	<u>8.880</u>	<u>8.97-8.89</u>	<u>100.9</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>10</u> NTU			
Acceptance Criteria: +/- 10%			
CAL ICV CCV	<u>2/15/12</u>	<u>04-06</u>	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		<u>2/15/12</u>	<u>834</u>	<u>1.413</u>	<u>809</u>	<u>3/12</u>	<u>1.414-1.403</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>20</u> NTU			
Acceptance Criteria: +/- 8%			
CAL ICV CCV	<u>2/15</u>	<u>15-20</u>	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		<u>2/15/12</u>	<u>836</u>	<u>4</u>	<u>0110969</u>	<u>2/12</u>	<u>4.25-4.05</u>	P F
CAL ICV CCV			<u>835</u>	<u>7</u>	<u>1091866</u>	<u>8/12</u>	<u>7.15-7.85</u>	P F
CAL ICV CCV			<u>839</u>	<u>10</u>	<u>2101326</u>	<u>7/12</u>	<u>10.10-0.01</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>100</u> NTU			
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV	<u>2/15</u>	<u>Jan</u>	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		<u>2/15/12</u>	<u>840</u>	<u>240 @ 25</u>	<u>3354</u>	<u>6/16</u>	<u>243.4-240.1</u>	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
Acceptance Criteria: +/- 5%			
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

Comments: _____

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification
- Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
- Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
- Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
- If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



**Geosyntec Consultants
Water Quality Instrument Calibration Form**

Project/Site: LC34

Project #: T20072

Field Personnel: D. Sillmore

Turbidimeter - Model/Serial # Hach 2100Q 1122664

Water Quality Meter - Model/Serial #: YSI 556 04K16614

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
		<u>2/16/12</u>	<u>711</u>	<u>18.75</u>	<u>9.314</u>	<u>923-931</u>	<u>100.4</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>1709</u>	<u>25.00</u>	<u>0.263</u>	<u>8.77</u>	<u>106.0</u>	<u>P F</u>
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>0</u> NTU			
		Acceptance Criteria: +/- 10%	
<u>CAL ICV CCV</u>	<u>2/16/12</u>	<u>0.05-0.00</u>	<u>P F</u>
<u>CAL ICV CCV</u>	<u>1</u>	<u>0.05</u>	<u>P F</u>
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
		<u>2/16/12</u>	<u>712</u>	<u>1.43</u>	<u>8809</u>	<u>3/12</u>	<u>1.419-1.414</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>1713</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>1.440</u>	<u>P F</u>
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>20</u> NTU			
		Acceptance Criteria: +/- 8%	
<u>CAL ICV CCV</u>	<u>2/16/12</u>	<u>175-200</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>20.5</u>	<u>P F</u>
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
		<u>2/16/12</u>	<u>714</u>	<u>4</u>	<u>0110969</u>	<u>4/12</u>	<u>4.11-4.02</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>713</u>	<u>7</u>	<u>1091866</u>	<u>5/13</u>	<u>7.29-7.05</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>713</u>	<u>10</u>	<u>2101326</u>	<u>7/12</u>	<u>10.19-10.0</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>1710</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>9.12</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>1710</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>7.07</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>1711</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>9.84</u>	<u>P F</u>

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
		Acceptance Criteria: +/- 6.5%	
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
		<u>2/16/12</u>	<u>726</u>	<u>240@25</u>	<u>3354</u>	<u>6/16</u>	<u>246-240.3</u>	<u>P F</u>
<u>CAL ICV CCV</u>		<u>2/16/12</u>	<u>1717</u>	<u>"</u>	<u>"</u>	<u>"</u>	<u>240.3</u>	<u>P F</u>
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std <u>NTU</u>			
		Acceptance Criteria: +/- 5%	
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>
<u>CAL ICV CCV</u>			<u>P F</u>

Specific Conductance Probe Cleaned? Yes (No) No

Dissolved Oxygen membrane Changed? Yes (No) No

Comments: _____

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) X Peristaltic Centrifugal Bladder
Pump (Make & Model): Grpump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Durham
Time @ Start of Purging: 10:03 Time @ End of Purging: 10:18 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)
Water Level: 5.56 ft. BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 61.7 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 35-42 ft. BLS

Table with 12 columns: Time (hrs), Cumulative Purge Volume (gal), Temp (°C), pH, Conductivity (mS/cm), Turbidity (NTU), Salinity (%), ORP (mV), DO (mg/L), TDS (g/L), Color, Comments. Rows contain data points from 10:03 to 10:18 with handwritten values for temperature, conductivity, etc.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

LC34-RW0007-038.5-20120214
Sample ID: LC34-RW0007-038.5-20120214 Time Collected: 10:18 Comments: VOC in BA, VFA, Biot, TOC, Sulfide, MGC, Anions, Alkalinity, Dissolved Metals, Dinc & vena
When using 3/16-in. ID tubing EV = ((0.041)(0.035 x tubing length)) + (flow thru vol.) = 0.32 gal
When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = 0.32 gal
0.041 x 0.035 x 47 x 0.25 = 0.32 gal
Duplicate (VOC): LC34-FD-20120214-01

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: J. Bartlett

Station (Well ID): LW0002I Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1338 Time @ End of Purging: 1353 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 627.5 ft. (BTOC)

Water Level: 5.70 ft. BTOC Total Well Depth: 30 ft. BLS Reference: - Well diameter: 2 in. Volume in well: 49 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen = 25-30 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1338	Start	24.81	8.64	0.366	21.1	0.17	36.7	2.67	0.232	clear	
1348	1.0	24.80	7.35	0.628	4.45	0.31	-61.2	1.07	0.411	"	
1350	1.2	24.83	7.31	0.640	5.47	0.31	-67.4	0.99	0.417	"	
1353	1.5	24.79	7.32	0.658	4.09	0.32	-72.9	0.86	0.430	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - LW0002I - 027.5 - 20120215
 Sample ID: _____ Time Collected: 1353 Comments: VOC, uBA, VFA, Br4F, TOC, Sulfide, MRE, Anions,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.30 gal Alkalinity, Dissolved Metals
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 0.041 x 0.035 x 35 + 0.25 = 0.30 gal
 QC: Anions (1 bottle); Duplicates (VFA): LC34-FD-20120215-013

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Sizemore

Station (Well ID): IW 0002D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1358 Time @ End of Purging: 1419 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 037.5 ft. (BTOC)

Water Level: 6.14 ft. BTOC Total Well Depth: 40 ft. BLS Reference: _____ Well diameter: 2 in. Volume in well: 6.5 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 35-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1359	Start	25.48	7.13	1.500	7.1	.74	957	.76	.95	Clear	None
1405	.5	25.33	6.98	1.260	6.4	.63	-279.1	.36	.82	"	"
1412	1.0	25.36	6.99	1.253	2.4	.62	-257.9	.34	.81	"	"
1419	1.5	25.37	6.99	1.251	4.0	.62	-242.9	.33	.81	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0002D-037.5-20120216
 Sample ID: _____ Time Collected: 1419 Comments: VOCs, nBA, VFA, Br&F, TOC, Sulfide, Mg, Arsenic,
Alkalinity, Dissolved Metals
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal
Duplicate (Br&F) LC34-IW0002D-037.5-20120216-DW

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. S. Moore

Station (Well ID): BW0001A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 8:11 Time @ End of Purging: 8:39 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)
 Water Level: 6.28 ft. BTOC Total Well Depth: 26 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.52 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 23-26 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
8:11	Start	23.14	7.36	.793	15.1	.39	-114.1	1.16	.51	Clear	none
8:18	.5	24.16	7.41	.761	6.4	.37	-111.2	.54	.50	"	"
8:25	1.0	24.20	7.73	.765	5.4	.37	-112.9	.48	.50	"	"
8:32	1.5	24.21	7.75	.766	4.8	.37	-113.0	.47	.56	"	"
8:39	2.0	24.22	7.75	.766	2.8	.37	-110.9	.45	.50	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001A - 0245-201202 - 8:39-8:45 Time Collected: 8:39-8:45 Comments: VOC & nBA, VFA, Bor F, TOC, Sulfide, MRE, Arsenic, Alkalinity, Dissolved Metals.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 QC - LC34-BW0001A - 024.5 - 21020216
 Alk ~~1~~ - 1 Bottle, P2, 125ml, Unpres.
 Duplicate (TOC) = LC34-FD - 20120216 - 01

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Siremore

Station (Well ID): BW0001B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Duckham

Time @ Start of Purging: 854 Time @ End of Purging: 924 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.89 ft. BTOC Total Well Depth: 33 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.66 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
START	Start	24.73	7.34	.981	6.5	.48	-2770	.48	.64	Clear	none
903	.5	24.09	7.37	.984	3.5	.48	-246.5	.31	.64	"	"
910	1.0	24.75	7.59	.985	3.2	.48	-250.1	.30	.64	"	"
917	1.5	24.76	7.60	.985	3.0	.48	-253.9	.29	.64	"	"
924	2.0	24.77	7.60	.985	2.5	.48	-254.1	.23	.64	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001B - 031.5 - 20120216
 Sample ID: _____ Time Collected: 924-939 Comments: VOC, nBA, VFA, Biot, TOC, Sulfide, MSE, Anions, Alkalinity, Dissolved Metals.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

EV LC34 - BW0001B - 031.5 - 20120216
 metals - (hot, PL, 250ml, unpb)

Duplicate (Sulfide): LC34 - FD - 20120216 - 002

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Sromore

Station (Well ID): BW0001C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 944 Time @ End of Purging: 1005 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.13 ft. BTOC Total Well Depth: 40 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.80 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
944	Start	24.19	7.12	1.357	8.4	.61	-219.5	.37	.89	Clear	none
951	.5	24.23	7.25	1.021	6.3	.75	-228.1	.91	.89	"	"
958	1.0	24.25	7.25	1.025	5.4	.75	-230.2	.29	.89	"	"
1005	1.5	24.24	7.25	1.025	3.9	.75	-229.1	.38	.89	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001C-0385-20120216
Sample ID: _____ Time Collected: 1005-1020 Comments: VOL % nBA, VFA, Br, I, TOC, SulAde, MEE, Anions, Alkalinity, Dissolved Metals, Dm & nCA
When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

Supplements (JTB)
LC34-FD-20120216-03
Br, I 130 (Hr) /PI, 125 (Hr) u/n/MS.

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Sizemore

Station (Well ID): BW00010 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: _____

Time @ Start of Purging: 1150 Time @ End of Purging: 1211 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 049.5 ft. (BTOC)

Water Level: 5.99 ft. BTOC Total Well Depth: 47 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 44-47 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1150	Start	25.93	6.07	2.124	4.4	1.50	-263.0	.36	1.95	Clear	none
1157	.5	25.22	6.68	2.911	1.5	1.51	-260.7	.40	1.89	"	"
1204	1.0	25.29	6.73	2.915	7.4	1.51	-250.8	.36	1.90	"	"
1211	1.6	25.43	6.73	2.916	7.9	1.51	-250.9	.36	1.90	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW00010-049.5-20120216 Time Collected: 1211 Comments: VOC & nBA, VFA, Br & I, TOC, Sulfide, MEE, Anions, Alkalinity, Dissolved Metals

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: Dme

Station (Well ID): BW0002A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1044 Time @ End of Purging: 1112 Total Purging Time: 28min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.85 ft. BTOC Total Well Depth: 26 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.52 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 23-26 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1044	Start	24.96	7.01	2.270	6.8	1.16	-239.8	.85	1.47	Clear	none
1051	.5	25.41	7.28	2.127	7.3	1.08	-249.1	.25	1.98	Clear	"
1058	1.0	25.38	7.36	2.110	6.5	1.07	-249.0	.20	1.37	Clear	"
1105	1.5	25.54	7.37	2.116	5.8	1.09	-249.0	.18	1.39	"	"
1112	2.0	25.39	7.37	2.113	4.5	1.09	-249.0	.17	1.39	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002A-024.5-20120215
 Sample ID: _____ Time Collected: 1112-1120 Comments: VOC & nBA, VFA, Br & P, TOC, MS2

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

QC LC34-BW0002A-024.5-20120215
 VFA - 2 Bottles, CG 140mL, H3PO4
 Duplicate (MS2): LC34-FD-20120215-011

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. S. Lomore

Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other), Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1003 Time @ End of Purging: 1024 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.97 ft. BTOC Total Well Depth: 33 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.66 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1003	Start	25.21	7.31	800	10.8	.39	-216.0	.50	.51	Clear	none
1010	.5	25.15	7.28	790	5.4	.37	-235.1	.31	.49	"	"
1017	1.0	25.16	7.26	792	4.8	.35	-200.1	.23	.47	"	"
1024	1.5	25.35	7.20	790	6.5	.35	-212.9	.22	.48	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002B-031.5-20120215
 Sample ID: _____ Time Collected: 1024 - 1043 Comments: NOC 4 nBA, VFA, Bn4F, TOC, MSE
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

LC34-BW0002B-031.5-20120215
 TOC - 3 bottles, 65, 40 ml, H2SO4

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: D. Szymose

Station (Well ID): BW0002C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1423 Time @ End of Purging: 1423 1444 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 5.45 ft. BTOC Total Well Depth: 46 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.80 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1423	Start	25.14	7.27	.762	14.3	.35	-190.1	.25	.47	Clear	None
1430	.5	25.32	7.44	.660	1.59	.32	-169.8	.12	.43	"	"
1437	1.0	25.25	7.44	.660	1.43	.32	-158.5	.11	.43	"	"
1444	1.5	25.23	7.45	.663	1.20	.32	-160.7	.10	.43	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002C-038.5-20120214 Time Collected: 1444-1504 Comments: VOC & nBA, VFA, Br&I, TOC, Sulfide, MZE, Anions, Alkalinity
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 Implicate (Anions): LC34-FD-20120214-03

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: D. Sillmore

Station (Well ID): BW00020 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Duckman

Time @ Start of Purging: 1342 Time @ End of Purging: 1403 Total Purging Time: 21 Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 5.45 ft. BTOC Total Well Depth: 47 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 44-47 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1345</u>	<u>Start</u>	<u>25.03</u>	<u>7.19</u>	<u>2.642</u>	<u>12.3</u>	<u>1.36</u>	<u>-291.8</u>	<u>2.1</u>	<u>1.72</u>	<u>Clear</u>	<u>none</u>
<u>1356</u>	<u>1.0</u>	<u>25.10</u>	<u>7.42</u>	<u>2.663</u>	<u>1.43</u>	<u>1.37</u>	<u>-281.3</u>	<u>0.02</u>	<u>1.73</u>	<u>"</u>	<u>"</u>
<u>0043 1403</u>	<u>1.5</u>	<u>25.11</u>	<u>7.39</u>	<u>2.669</u>	<u>1.54</u>	<u>1.38</u>	<u>-298.1</u>	<u>0.05</u>	<u>1.74</u>	<u>"</u>	<u>"</u>
<u>1410</u>	<u>2.0</u>	<u>25.16</u>	<u>7.41</u>	<u>2.670</u>	<u>1.41</u>	<u>1.38</u>	<u>-288.0</u>	<u>0.09</u>	<u>1.74</u>	<u>"</u>	<u>"</u>

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW00020-045.5-20120219 Time Collected: 1410 - 1420 Comments: VOC & nGA, VFA, Bor & I, TOC, MGC #

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. Sizemore

Station (Well ID): BW0003A Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other), Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1238 Time @ End of Purging: 1305 Total Purging Time: 27 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.30 ft. BTOC Total Well Depth: 26 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.52 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 23-26 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1238	Start	25.79	7.01	1757	2.2	.49	-201.2	1.23	175	49	Clear none
1245	.5	24.74	7.47	1759	2.0	.37	-152.4	2.85	172	49	" "
1252	1.0	24.78	7.48	1759	4.3	.37	-154.3	.16	179	49	" "
1258	1.5	24.79	7.47	1759	5.8	.37	-153.3	.17	179	49	" "
1305	2.0	24.83	7.47	1758	2.1	.37	-150.9	.18	179	49	" "

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0003A - 024.5 - 20120212
 Sample ID: _____ Time Collected: 1305 - 1312 Comments: VOL, NBA, VFA, B, 4F, TOC, M&S
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. Sizemore

Station (Well ID): BW0003B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1207 Time @ End of Purging: 1228 Total Purging Time: 21 Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.29 ft. BTOC Total Well Depth: 33 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.66 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 30-33 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1207	Start	25.06	7.38	.809	4.5	.39	-183.4	.36	.53	Clear	none
1214	.5	25.09	7.40	.808	5.3	.39	-171.3	.28	.52	4	"
1221	1.0	25.07	7.48	.795	2.7	.39	-168.7	.22	.52	4	"
1228	1.5	25.15	7.52	.795	2.4	.39	-161.3	.21	.52	4	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003B-031.5-20120215
 Sample ID: _____ Time Collected: 1228 Comments: VOC & nBA, VFA, Br & I, TOC, MES
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 QC LC34-BW0003B-031.5-20120215
 Br & I - 1 Bottle, PL, 150 mL, None

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: O. Sizemore

Station (Well ID): BW0003C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1129 Time @ End of Purging: 1150 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 338.5 ft. (BTOC)

Water Level: 5.15 ft. BTOC Total Well Depth: 40 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.8 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 37-40 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1129	Start	26.32	6.82	.880	5.9	.83	-224.4	2.79	.98	Clear	none
1136	.5	24.90	7.44	1.147	4.8	.57	-237.5	.23	.75	"	"
1143	1.0	24.98	7.48	1.183	8.4	.64	-195.4	.18	.84	"	"
1150	1.5	24.99	7.50	1.189	7.9	.64	-199.2	.17	.84	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-038.5-20120215 Time Collected: 1150-1206 Comments: VOC & nBA, VFA, Br & I, TOC, Sulfide, MSE, Anions, Alkalinity, Dhc & verA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Duplicate (Alkalinity): LC34-TO-26120215-012

QC LC34-BW0003C-038.5-20120215
 Sulfide - 1 Bottle, PI, 270 ml, WAAOM

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. S. Moore

Station (Well ID): BW0003D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1314 Time @ End of Purging: _____ Total Purging Time: _____ Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 5.25 ft. BTOC Total Well Depth: 47 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 44-47 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1314	Start	24.73	6.26	2.515	5.0	1.29	-255.9	.36	1.64	Clear	none
1321	.5	24.79	6.55	2.517	2.9	1.29	-280.2	.31	1.65	"	"
1328	1.0	24.93	6.80	2.505	3.7	1.29	-289.1	.16	1.63	"	"
1335	1.5	24.99	6.89	2.522	5.1	1.30	-306.7	.18	1.64	"	"
1346	2.0	25.00	6.90	2.528	5.1	1.30	-313.7	.19	1.65	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003D-045.5-20120215 Time Collected: 1340-1405 Comments: VOL & BA, VFA, P&T, TOL, M&S

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

QC BW0003D-045.5-20120215
M&S-3 bottle (6, 40mL, HCL)

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: J. Bartlett

Station (Well ID): AW00008 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1055 Time @ End of Purging: 1110 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 6.31 ft. BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen: 47-57 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1055	Start	23.57	8.98	2,525	2.44	1.30	-237.0	2.12	1.642	clear	
1105	1.0	23.96	8.86	2,543	0.72	1.31	-255.7	0.59	1.652	"	
1107	1.2	23.96	8.84	2,541	0.79	1.31	-255.5	0.55	1.651	"	
1110	1.5	23.99	8.82	2,540	0.64	1.31	-254.9	0.49	1.651	"	

* pH probe malfunctioning.

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-AW0008-052.0-20120214 Time Collected: 1110 Comments: VOC & NPA, VFA, Br & T, TOC, Sulfide, MER, Anions,

When using 3/16-in. ID tubing EV=((0.041)(0.035x tubing length)+(flow thru vol.)= 0.34 gal Alkalinity, Dissolved Metals, Am & ver A

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

$0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$

Duplicate (Dissolved Metals) = LC34-FD-20120214-02

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. S. Remore

Station (Well ID): FW0002D1 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Duck

Time @ Start of Purging: 1305 Time @ End of Purging: 1333 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 6.28 ft. BTOC Total Well Depth: 55 ft. BLS Reference: - Well diameter: 2 in. Volume in well: 8.9 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 50-55 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1305	Start	25.79	7.06	2.623	—	1.35	-279.5	1.68	1.70	Clear	none
1312	1.5	25.50	7.23	2.575	28.6	1.33	-314.2	.53	1.68	"	"
1319	1.0	25.24	7.05	2.581	9.4	1.33	-301.9	.39	1.68	"	"
1326	1.5	25.28	7.07	2.581	4.8	1.33	-285.9	.38	1.68	"	"
1333	2.0	25.19	7.07	2.590	3.8	1.34	-307.9	.31	1.69	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-FW0002D1 - 052.5 - 20120216
 Sample ID: 1333-1349 Time Collected: 1333-1349 Comments: VOC & MBA, VFA, Bi & J, TOC, Cu/Pb, MEE, Arsenic, Amalinity, Dissolved Metals

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

OC LC34-FW0002D1-052.5-20120216
 VOC & MBA - 3 Bottles, uoal, CG, umbres.

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Sizemore

Station (Well ID): BW0001E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other), Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1115 Time @ End of Purging: 1136 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 5.79 ft. BTOC Total Well Depth: 54 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.1 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen = 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1115	Start	25.74	7.59	2.647	7.2	1.36	-281.9	1.89	1.69	Clear	none
1122	.5	25.19	7.47	2.522	4.1	1.30	-313.1	.33	1.64	u	u
1129	1.0	25.20	7.46	2.520	3.5	1.30	-297.6	.28	1.64	u	u
1136	1.5	25.23	7.47	2.520	2.3	1.30	-299.6	.26	1.64	u	u

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001E-052.5-20120216
 Sample ID: _____ Time Collected: 1136-1147 Comments: VOC, nDA, VFA, Br&F, TOC, Sulfide, MEE, AmB us,
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length)+(flow thru vol.)= _____ gal Air Volatility, Dissolved Metals, Dye & ucrA
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/16/12 Sampled By: D. Sizemore

Station (Well ID): BW0001F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: _____

Time @ Start of Purging: 1035 Time @ End of Purging: 1103 Total Purging Time: 28 min. Depth of Pump or Intake Tubing: 059.15 ft. (BTOC)

Water Level: 6.49 ft. BTOC Total Well Depth: 61 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.2 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 58-61 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1035	Start	24.97	6.87	2.531	4.5	1.30	-275.4	1.37	1.65	Clear	none
1042	.5	25.04	7.08	2.576	3.4	1.30	-269.5	.34	1.65	"	"
1049	1.0	25.00	7.29	2.534	4.0	1.30	-271.1	.34	1.65	"	"
1056	1.5	25.11	7.26	2.531	1.5	1.30	-270.6	.32	1.64	"	"
1103	2.0	25.10	7.25	2.531	0.93	1.30	-287.1	.30	1.64	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001F - 059.15 - 201202 16
 Sample ID: _____ Time Collected: 1103 - 1112 Comments: Vol 4, nBA, VFA, Br, T, TOC, Sulfide, MSE, Anions,
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal Alkalinity, Dissolved Metals
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: D.S. Remore

Station (Well ID): BW0002E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1258 Time @ End of Purging: 1326 Total Purging Time: 28 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 6.69 ft. BTOC Total Well Depth: 54 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.1 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1258</u>	<u>Start</u>	<u>25.23</u>	<u>7.95</u>	<u>2.536</u>	<u>39.5</u>	<u>1.31</u>	<u>-233.6</u>	<u>.15</u>	<u>1.65</u>	<u>Clear</u>	<u>none</u>
<u>1312</u>	<u>1.0</u>	<u>25.25</u>	<u>7.64</u>	<u>2.543</u>	<u>2.43</u>	<u>1.31</u>	<u>-231.9</u>	<u>.12</u>	<u>1.65</u>	<u>Clear</u>	<u>"</u>
<u>1319</u>	<u>1.5</u>	<u>25.32</u>	<u>7.63</u>	<u>2.545</u>	<u>1.24</u>	<u>1.31</u>	<u>-260.9</u>	<u>.09</u>	<u>1.66</u>	<u>Clear</u>	<u>"</u>
<u>1326</u>	<u>2.0</u>	<u>25.35</u>	<u>7.65</u>	<u>2.548</u>	<u>1.00</u>	<u>1.31</u>	<u>-265.5</u>	<u>.09</u>	<u>1.66</u>	<u>Clear</u>	<u>"</u>

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002E-052.5-20120214 Time Collected: 1326-1348 Comments: VOCs, nBA, VFA, Br & F, TOC, M&E

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: D. Sizemore

Station (Well ID): BW0002F Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: SM Durham

Time @ Start of Purging: 1217 Time @ End of Purging: 1245 Total Purging Time: 28 Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 5.71 ft. BTOC Total Well Depth: 61 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.2 gal
Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 58-61 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1217	Start	25.11	7.29	2.613	0.84	1.34	-269.1	0.31	1.69	Clear	None
1231	1.0	24.93	7.69	2.579	0.95	1.33	-182.6	0.12	1.68	"	
1238	1.5	24.98	7.72	2.585	1.02	1.33	-203.9	0.11	1.68	Clear	
1245	2.0	24.95	7.71	2.586	0.75	1.33	-204.0	0.11	1.68	Clear	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002F-059.5-20120214 Time Collected: (1245)-1256 Comments: VOC, nBA, VFA, BCF, TOC, MSE

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. Sillmore

Station (Well ID): BW0003E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1406 Time @ End of Purging: 1427 Total Purging Time: 21 Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)
 Water Level: 5.55 ft. BTOC Total Well Depth: 54 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.1 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 51-54 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1406	Start	25.09	4.91	2.183	—	1.12	-132.9	3.26	1.45	Clear	none
1413	.5	25.03	6.85	2.530	3.5	1.30	-295.9	.27	1.64	"	"
1420	1.0	25.04	6.84	2.535	3.0	1.31	-284.3	.23	1.66	"	"
1427	1.5	25.05	6.84	2.559	2.3	1.32	-299.8	.19	1.67	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003E-052.5-20120215 Time Collected: 1427 Comments: VOC, nDA, VFA, Br & I, TOC, MEE, uCA & n
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: D. Siemore

Station (Well ID): BW 0003F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Arden

Time @ Start of Purging: 1442 Time @ End of Purging: 1503 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 5.23 ft. BTOC Total Well Depth: 61 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.2 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen = 58-61 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1442	Start	24.95	6.32	2.586	—	1.33	-283.6	.38	1.69	Clear	none
1449	.5	24.95	6.86	2.601	7.2	1.34	-269.5	.32	1.69	"	"
1458	1.0	24.93	6.89	2.612	1.6	1.35	-316.3	.24	1.70	"	"
1503	1.5	24.94	6.88	2.612	.96	1.35	-269.5	.18	1.70	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003F-059.5-20120215 Time Collected: 1503 Comments: VOC, nBA, VFA, B, KI, TOC, MEZ

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: J. Bartlett

Station (Well ID): IW0076 Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1432 Time @ End of Purging: 1453 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 075.0 ft. (BTOC)

Water Level: 6.14 ft. BTOC Total Well Depth: 80 ft. BLS Reference: — Well diameter: 2 in. Volume in well: 13.09 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 70-80 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1432	Start	25.21	5.33	0.991	12.7	0.49	50.0	2.46	0.1635	clear	
1442	1.0	24.82	6.09	2.060	9.87	1.05	-18.0	0.57	1.354	"	
1445	1.3	24.89	6.75	2.289	20.8	1.17	-46.4	0.54	1.491	"	
1449	1.7	24.96	7.05	2.367	19.9	1.21	-59.1	0.51	1.540	"	
1451	1.9	24.98	7.07	2.382	17.8	1.22	-61.5	0.52	1.549	"	
1453	2.1	24.98	7.12	2.392	16.4	1.23	-62.8	0.51	1.586	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0076-075.0-20120215
 Sample ID: _____ Time Collected: 1453 Comments: VOL & WBA, VFA, DOC & F, TOC, MEE, Dissolved Metals
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.37 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
 0.041 x 0.035 x 85 + 0.25 = 0.37 gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: J. Bartlett

Station (Well ID): IW00670 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter:

Time @ Start of Purging: 1400 Time @ End of Purging: 1415 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 5.22 ft. BTOC Total Well Depth: 48 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.86 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 38-43 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1400	Start	24.20	8.39	2.540	40.0	1.31	-196.6	2.15	1.651	clear	
1410	1.0	24.23	8.53	2.543	2.43	1.31	-230.4	0.44	1.653	"	
1412	1.2	24.32	8.54	2.543	1.95	1.31	-239.9	0.36	1.653	"	
1415	1.5	24.34	8.52	2.542	1.58	1.31	-240.1	0.33	1.652	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW00670-040.5-20120214 Time Collected: 1415 Comments: VOLGNBA, TOC

When using 3/16-in. ID tubing EV=((0.041)(0.035x tubing length)+(flow thru vol.)=0.32 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= gal

0.041 x 0.035 x 48 + 0.25 = 0.32 gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: J. Bartlett

Station (Well ID): JW007104 Purge Method: Pump Bailer Pump Type: Peristaltic Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Deerham

Time @ Start of Purging: 1323 Time @ End of Purging: 1346 Total Purging Time: 23 min Depth of Pump or Intake Tubing: 670.0 ft. (BTWC)

Water Level: 5.14 ft. BTWC Total Well Depth: 75.73 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Screen: 65.75 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1323	Start	24.08	7.78	2.587	703	1.34	-53.4	1.10	1.682	white	
1333	1.0	24.12	7.69	2.577	181	1.33	-58.2	0.39	1.675	"	
1338	1.5	24.11	7.65	2.576	36.6	1.33	-58.3	0.45	1.674	clear	
1342	1.9	24.06	7.66	2.577	17.9	1.33	-62.6	0.41	1.674	"	
1344	2.1	24.10	7.65	2.575	13.3	1.33	-63.1	0.40	1.674	"	
1346	2.3	24.05	7.63	2.575	9.74	1.33	-60.2	0.39	1.674	"	

* pit probe malfunctioning

- Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
- Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
- Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
- If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
- For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-JW007104-078.0-20120214 Time Collected: 1346 Comments: VOC & nBA, TOC

When using 3/16-in. ID tubing EV = ((0.041) (0.035 x tubing length)) + (flow thru vol.) = 0.037 gal

When using 1/4-in. ID tubing EV = (0.0026 x tubing length) + (flow thru vol.) = gal

0.041 x 0.035 x 80 + 0.25 = 0.37 gal

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: J. Bartlett

Station (Well ID): IW0070D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1155 Time @ End of Purging: 1210 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 4.91 ft. BTOC Total Well Depth: 43 ft. BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 0.86 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 38-43 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1155	Start	25.22	7.62	2.429	27.7	1.25	-121.0	1.03	1.587	clear	
1205	1.0	25.16	7.74	2.538	8.35	1.31	-160.8	0.30	1.649	"	
1207	1.2	25.18	7.73	2.539	6.02	1.31	-166.1	0.28	1.651	"	
1210	1.5	25.16	7.73	2.539	5.73	1.31	-169.9	0.30	1.650	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0070D-040.5-20120215 Time Collected: 1210 Comments: VOC & nBA, TOC

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.32 gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

$$0.041 \times 0.035 \times 4.8 + 0.25 = 0.32 \text{ gal}$$

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: J. Bartlett

Station (Well ID): IW007001 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Burham

Time @ Start of Purging: 1123 Time @ End of Purging: 1138 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)

Water Level: 5.10 ft. BTOC Total Well Depth: 75 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen = 65-75 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1123	Start	25.07	7.57	1.919	23.0	1.03	-60.1	2.02	1.377	clear	
1133	1.0	25.01	7.66	2.558	5.27	1.32	-18.4	0.42	1.664	"	
1135	1.2	24.99	7.66	2.568	3.12	1.32	-18.5	0.34	1.669	"	
1138	1.5	24.97	7.67	2.569	3.01	1.32	-24.4	0.31	1.670	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW007001-070.0-20120215 Time Collected: 1138 Comments: VOL & nRA, TOC

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.37 gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = _____ gal

$0.041 \times 0.035 \times 80 + 0.25 = 0.37 \text{ gal}$

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/15/12 Sampled By: J. Bartlett

Station (Well ID): IW0071D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1043 Time @ End of Purging: 1058 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 2.85 ft. BTOC Total Well Depth: 43 ft. BLS Reference: — Well diameter: 3/4 in. Volume in well: 0.86 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen : 38-43 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1043	Start	23.06	7.39	2.055	7.16	1.05	-109.9	1.21	1.352	clear	
1053	1.0	23.33	7.65	2.279	1.36	1.17	-88.9	0.25	1.482	"	
1055	1.2	23.37	7.66	2.282	0.90	1.17	-87.8	0.29	1.488	"	
1058	1.5	23.41	7.66	2.283	0.57	1.17	-87.9	0.31	1.494	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0071D-040.5-20120215
 Sample ID: _____ Time Collected: 1058 Comments: VOC & nBA, TOC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.32 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 48 + 0.25 = 0.32 gal
QC: VOC (3 vials)

Monitor Well Sampling

Site: LC 34 Project No.: TR0272A Task: 38 Date: 2/14/12 Sampled By: J. Bartlett

Station (Well ID): W006701 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: _____

Time @ Start of Purging: 1439 Time @ End of Purging: 1454 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)

Water Level: 2.97 ft. BTOC Total Well Depth: 73 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen = 63-73 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1439	Start	23.11	8.23	1.879	37.7	0.98	-159.2	1.41	1.287	clear	
1449	1.0	23.14	7.69	2.483	2.79	1.28	-89.7	0.36	1.615	"	
1451	1.2	23.15	7.66	2.488	1.85	1.28	-79.6	0.30	1.617	"	
1454	1.5	23.17	7.68	2.492	1.76	1.28	-73.4	0.27	1.620	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

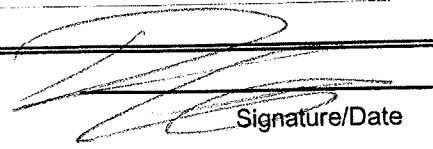
Sample ID: LC34-W006701-0680-20120214 Time Collected: 1454 Comments: VOCs, nBA, TOL
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.36 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal
0.041 x 0.035 x 78 + 0.25 = 0.36 gal

Project: <u>LC30</u>	Date: <u>2/3/12</u>
Project No.: <u>TR0272</u>	Task No.: _____
Contractors: <u>GPE</u>	_____

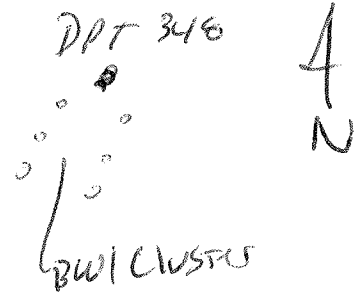
Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: <u>DPT 346, 347 & 348</u>	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0725 Meet drillers @ Badging Station, mob to site.
0745 Arrive site; PMS conducts tailgate meeting w/ safety discussion. Drillers decon & set up DPT 346.
1006 DPT 346 Complete; decon & set up on DPT 347.
1145 DPT 347 Complete; decon & set up on DPT 348
1424 DPT 348 Complete; Drillers begin grouting 3 soil borings & cleaning up site.
1539 Drillers have grouted all boreholes & have cleaned up site. PMS begins securing drum pallet; Drillers depart site.
1600 PMS departs site.

Plans/Future Activities

 2/3/12
Signature/Date

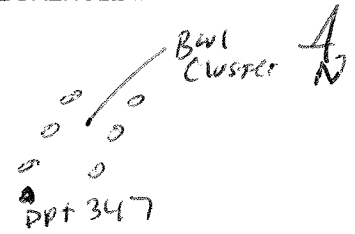
BORING LOG



BORING NO.: DPT 348 PROJECT NO.: TRO2T2 PAGE 1 OF 1
 SITE: LC 34 DATE: 2/13/12
 TOOLS AND METHOD: Macro Core BIT DIA: 2 1/4
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: _____
 DRILLING COMPANY: GP RIG: 2001/201 7822AT
 DRILLERS: Mike Bishop LOGGERS: DMS
Scott Wilson

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
		31	2.6	
Gray Silty fine to med. SAND w/ frag. shell (~5%)	Macro Sampler	32	7.1	
		33	2.4	
		34	5.4	
- Same		35	4.8	- Collect grab sample @ 1250 - DPT 348 - 034.5 for 8200
	Macro Sampler	36	2.9	
		37	11.1	- Grab sample collected @ 1300 - DPT 348 - 037.0 for 8200
- Same		38	10.8	
		39	6.5	
		40	4.3	- Grab sample collected @ 1311 - DPT 348 - 040.0 for 8200
- Gray CLAY w/ frag. shell (~1%) below 45.5'	Macro Sampler	41	7.7	
		42	8.2	
		43	6.6	
- Gray silty med SAND w/ some frag. shell (~5%) below 49'		44	7.5	
	Macro Sampler	45	5.1	- Grab sample collected @ 1312 - DPT 348 - 045.5 for 8200
		46	4.9	
- Same	Macro Sampler	47	3.2	- Grab sample collected @ 1321 - DPT 348 - 047.0 for 8200
		48	10.1	
		49	9.6	- Grab sample collected @ 1330 - DPT 348 - 048.5 for 8200
- Same	Macro Core	50	4.3	
		51	2.1	
		52	1.5	
- Same	Macro Core	53	0.9	- Grab sample collected @ 1345 - DPT 348 - 053.0 for 8200
		54	0	
		55	0	
- Same	Macro Core	56	0	
		57	0	
		58	0	
		59	0	
		60	0	- Boring terminated @ 60' and abandoned at 60'

consultants 347



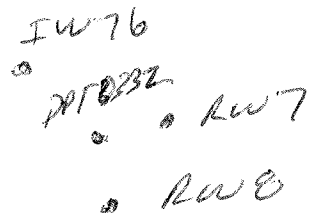
BORING NO.: DPT0347-036 PROJECT NO.: 710272 PAGE 1 OF 1
 SITE: LC34 DATE: 2/13/12
 TOOLS AND METHOD: 2 1/2" DIA Macro Core BIT DIA: 2 1/4"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: _____
 DRILLING COMPANY: GPF RIG: Geoprobe 762DT
 DRILLERS: Nick Bishop LOGGERS: DMS

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
		31	0	
Gray fine to med SAND w/ fragmented shell (~5%)	Macro Core	32	0	
		33	0	
		34	0	
		35	0.55025	
	Macro Core	36	1.9	
		37	6.3	-- Grab Sample collected @ 1035 - DPT 0347-037.0 for 8260
		38	2.4	
		39	3.5	
-- No recovery 40'-45' ^{DMS} sign of peridotite residual shell & fine sand ^{DMS} in core sampler		40	6.2	-- Grab Sample collected @ 1045 - DPT 0347-040.0 for 8260 and DMC
	Macro Core	41	7.71	
		42	2.4	
		43	5.1	
		44	3.7	
-- Gray ^{DMS} CLAY w/ fragmented shell (~1%), med plasticity	Macro Core	45	2.8	-- Grab Sample collected @ 1055 - DPT 0347-045.5 for 8260 and DMC
		46	5.9	
	Macro Core	47	3.5	-- Grab Sample collected @ 1107 - DPT 0347-047.0 for 8260 and DMC
		48	2.1	
		49	4.8	
-- Gray silty fine SAND w/ fragmented shell (5%-10%)		50	11.2	-- Grab sample collected @ 1115 - DPT 0347-050.0 for 8260 and DMC
	Macro Core	51	1.2	
		52	0.9	
	Macro Core	53	0.2	-- Grab sample collected @ 1126 - DPT 0347-050.5 for 8260
		54	0	
		55	0	-- Grab Sample collected @ 1135 - DPT 0347-050.5 for 8260 and DMC
-- Same	Macro Core	56	0	
		57	0	
		58	0	
		59	0	
		60	0	

Boring terminated @ 60' and abandoned w/ gravel

BORING LOG

BOREHOLE LOCATION MAP



BORING NO.: DPT 0346 PROJECT NO.: T20272 PAGE 1 OF 1
 SITE: LC34 DATE: 2/13/12
 TOOLS AND METHOD: 2 1/2" Dia Macro Core BIT DIA: 2 1/4"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: _____
 DRILLING COMPANY: GPI RIG: Cooper 752 DT
 DRILLERS: Nick Bishop LOGGERS: DMS
Scott Wilson

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
		31	0	
		32	0	
	Macro Sample	33	1.2	
		34	3.9	
		35	2.4	
		36	3.1	
	Macro Sample	37	2.5	Grab Sample collected @ 845 - DPT 0346-37.0 for B260
		38	11.0	
		39	9.3	Grab Sample collected @ 858 - DPT 0346-40.0 for B260 and DHC
		40	24.1	
		41	12.3	
	Macro Sample	42	6.5	
		43	7.3	Grab Sample collected @ 909 - DPT 0346-43.5 for B260 and DHC
Gray fine to med. SAND w/ fragmented shell (5%)		44	11.9	
Gray Sandy CLAY w/ med. plasticity below 44'		45	7.6	Grab Sample collected @ 930 - DPT 0346-46.5 for B260 and DHC
		46	6.3	Grab Sample collected @ 942 - DPT 0346-48.0 for B260 and DHC
	Macro Sample	47	4.9	
		48	5.4	
Gray Silty fine SAND below 49'		49	2.3	
		50	7.9	
	Macro Sample	51	8.2	
		52	1.4	Grab Sample collected @ 0953 - DPT 0346-53.0 for B260 and DHC
		53	0	
		54	0.1	Grab Sample collected @ 1006 - DPT 0346-55.0 for B260
Same		55	0	
		56	0	
		57	0	
	Macro Sample	58	0	
		59	0	
		60	0	
				Boring term. @ 60' and abandoned w/ gravel
				* Grab Sample collected @ 919 - DPT 0346-58.0 for B260

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC39

Project #: 200523
EQ 05108

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MP5 / 04K16614 A4

Turbidimeter - Model/Serial #: H444 2100A / 101102006399

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
							Acceptance Criteria: +/- 0.3mg/L	
CAL ICV CCV		3/15/12	1324	25.80	8.114	8.05/8.11	99.2/100.0	P F
CAL ICV CCV		3/16/12	0846	23.73	8.203	8.25	102	P F
CAL ICV CCV					8.466			P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
				Acceptance Criteria: +/- 10%
CAL ICV CCV		3/15/12	9.74	P F
CAL ICV CCV		3/16/12	9.34	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
								Acceptance Criteria: +/- 5%
CAL ICV CCV		3/15/12	1335	1.413	9373	12-2012	1.448/1.413	P F
CAL ICV CCV		3/16/12	0903	"	"	"	1.378	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
				Acceptance Criteria: +/- 8%
CAL ICV CCV		3/15/12	19.5	P F
CAL ICV CCV		3/16/12	20.2	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
								Acceptance Criteria: +/- 0.2 SU
CAL ICV CCV		3/15/12	1327	4.0	211380	10-2013	3.91/4.00	P F
CAL ICV CCV				7.0	2110532	10-2013	7.01/7.00	P F
CAL ICV CCV				10.0	2101366	07-2012	9.86/10.00	P F
CAL ICV CCV		3/16/12	0858				7.07	P F
CAL ICV CCV				"	"	"	3.97	P F
CAL ICV CCV							9.99	P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
				Acceptance Criteria: +/- 6.5%
CAL ICV CCV		3/15/12	98.4	P F
CAL ICV CCV		3/16/12	101	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
								Geosyntec Acceptance Criteria: +/- 5%
CAL ICV CCV		3/15/12	1340	240 @ 25	3354	06-2016	240.4/240.0	P F
CAL ICV CCV		3/16/12	0907	"	"	"	241.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std 800 NTU	Date	Reading (NTU)	Pass or Fail
				Acceptance Criteria: +/- 5%
CAL ICV CCV		3/15/12	776	P F
CAL ICV CCV		3/16/12	799	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 Comments: _____

CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: F05528 Task: 17th Date: 3/15/12 Sampled By: J. BARTLET

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Inepump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1417 Time @ End of Purging: 1431 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)
 Water Level: 8.29 ft. STD Total Well Depth: 57 ft. BLS Reference: _____ Well diameter: 6 in. Volume in well: 84 gal
 Screen: 47-57 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1417	Start	26.00	7.42	2.391	2.64	1.23	-249.7	1.21	1.557	clear	
1427	1.0	25.83	7.53	2.460	0.74	1.26	-234.9	0.34	1.600	"	
1429	1.2	25.83	7.52	2.476	0.82	1.27	-226.6	0.36	1.610	"	
1431	1.4	25.86	7.52	2.494	0.76	1.28	-232.0	0.38	1.622	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-20120315
 Sample ID: _____ Time Collected: 1431 Comments: NOL + n BA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.34 gal
 When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= — gal
(0.041)(0.035)(62) + 0.25 = 0.34 gal

Monitoring Well Sampling

Site: LC34 Project No.: RO 05528 Task: 1740 Date: 3/15/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1352 Time @ End of Purging: 1406 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)
 Water Level: 5.79 ft. STDG Total Well Depth: 42 ft. BIS Reference: - Well diameter: 6 in. Volume in well: 62 gal.
 Screen: 35-42 ft. BIS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1352	Start	25.43	7.67	1.053	7.18	0.51	-227.8	0.61	0.670	clear	
1402	1.0	25.60	7.78	0.797	5.45	0.39	-224.7	0.41	0.518	"	
1404	1.2	25.66	7.78	0.795	5.83	0.39	-227.6	0.34	0.517	"	
1406	1.4	25.65	7.78	0.794	5.63	0.39	-221.6	0.32	0.516	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007 - 038.5 - 20120315
 Sample ID: _____ Time Collected: 1406 Comments: VOC + nBA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.32 gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= - gal
 (0.041)(0.035)(47) + 0.25 = 0.32 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: FO 05526 Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YS1556MPS/06012138AL Turbidimeter - Model/Serial #: HACH2100Q/11020007557

DEP SOP FT 1500	Temp (°C)	Saturation (mg/L)	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV	23.01	8.578	9.32/8.58	108.6/100.0	P
CAL ICV CCV	25.70	8.156	7.49	91.9	P
CAL ICV CCV					P
CAL ICV CCV					P

DEP SOP FT 1200	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV	1413	8609	02-2012	1454/1413	P
CAL ICV CCV	"	"	"	1.371	P
CAL ICV CCV					P
CAL ICV CCV					P
CAL ICV CCV					P
CAL ICV CCV					P

DEP SOP FT 1100	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV	410	0110969	11-2012	400/400	P
CAL ICV CCV	710	1081800	08-2013	715/710	P
CAL ICV CCV	1010	2101326	07-2012	994/999	P
CAL ICV CCV	"	"	"	4.13	P
CAL ICV CCV	"	"	"	7.03	P
CAL ICV CCV	"	"	"	9.94	P

SOP N/A	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV	229.025	100713	06-2012	203.6/229.0	P
CAL ICV CCV	"	"	"	232.7	P
CAL ICV CCV					P
CAL ICV CCV					P

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/19/12	10.6	P
CAL ICV CCV	"	10.7	P
CAL ICV CCV			P
CAL ICV CCV			P

11 - 40 NTU Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/19/12	15.6	P
CAL ICV CCV	"	21.2	P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

41 - 100 NTU Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/19/12	93.3	P
CAL ICV CCV	"	104	P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P
CAL ICV CCV			P

>100 NTU Std	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	4/19/12	747	P
CAL ICV CCV	"	814	P
CAL ICV CCV			P
CAL ICV CCV			P

Comments: * Failed DO CCV qualified w/

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Monitoring Well Sampling

Site: LC34 Project No.: FO 05526 Task: 17th Date: 9/19/12 Sampled By: J. Sacke H
 Station (Well ID): RW0007 Pump Method: (Pump) Bailor Pump Type: () Teflon () SS () Other X Peristaltic () Centrifugal () Bladder
 Pump (Make & Model): Geo pump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Duckman
 Time @ Start of Purging: 1054 Time @ End of Purging: 1112 Total Purging Time: 10 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.84 ft. BTOC Total Well Depth: 42 ft. 8.5 Reference: - Well diameter: 6 in. Volume in well: 61.7 gal
 Screen: 35-42 ft. 8.5 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1054	Start	24.59	7.31	2.192	7.92	1.12	-212.9	1.86	1.422	Clear	
1104	1.0	24.68	7.50	2.054	5.06	1.05	-235.8	1.16	1.334	"	
1109	1.5	24.56	7.48	2.050	3.32	1.04	-232.9	1.15	1.332	"	
1112	1.8	24.67	7.46	2.043	3.56	1.04	-234.1	1.10	1.328	"	
								qualified with			
								* Filled DO cell.			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: $\pm 5.0\%$ of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007 - 038.5 - 20120419
 Sample ID: 1112 Time Collected: 1112 Comments: VOC + nBA
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.32 gal
 When using 1/4-in. ID tubing EV = ((0.0026x tubing length)) + (flow thru vol.) = - gal
(0.041)(0.035x 47) + 0.25 = 0.32 gal

Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 1770 Date: 4/19/12 Sampled By: J. Bartlett
 Station (Well ID): RW0008 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Δ Peristaltic Centrifugal Bladder
 Pump (Make & Model): Groppump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham
 Time @ Start of Purging: 1125 Time @ End of Purging: 1141 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 12.07 ft. BTOC Total Well Depth: 57 ft. BCS Reference: Screen: 47-57 ft. BCS
 Well diameter: 6 in. Volume in well: 83.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1125	Start	24.81	7.17	2.516	123	1.30	-174.9	2.41	1.630	gray	
1135	1.0	24.36	7.67	2.412	163	1.24	-215.8	1.07	1.568	clear	
1137	1.2	24.66	7.65	2.408	135	1.24	-218.4	0.99	1.566	11	
1139	1.4	24.67	7.66	2.416	114	1.24	-218.5	1.07	1.571	11	
1141	1.6	24.52	7.65	2.418	0.90	1.24	-219.5	1.08*	1.571	11	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.
 LC34-RW0008 - 052.0 - 26120419
 Sample ID: LC34-RW0008-052.0-26120419 Time Collected: 1141 Comments: VOL + WBA
 When using 3/16-in. ID tubing EV = (0.041)(0.035x tubing length) + (flow thru vol.) = 0.134 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = gal
 (0.041)(0.035x62) + (0.25) = 0.34 gal

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: F05528 Field Personnel: J. Bartelt

Water Quality Meter - Model/Serial #: YSI 556 MPS / 05D2373 AK Turbidimeter - Model/Serial #: HACH 2100Q / 110206007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		5/17/12	0728	22.89	8.595	7.11/8.59	82.5/100.0	P F
CAL ICV CCV		"	1103	24.98	8.325	7.22	86.4	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU Std <u>10</u> NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	5/17/12	9.21	P F
CAL ICV CCV	"	11	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		5/17/12	0754	1.413	4573	4-2-2012	1.246/1.413	P F
CAL ICV CCV		"	1113	"	8309 JB	"	1.428	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU Std <u>20</u> NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	5/17/12	22.5	P F
CAL ICV CCV	"	21.4	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		5/17/12	0734	4.0	0110969	4-1-2012	2.98/4.00	P F
CAL ICV CCV		"	"	7.0	1001860	08-2013	5.96/7.00	P F
CAL ICV CCV		"	"	10.0	2101326	07-2012	8.91/10.00	P F
CAL ICV CCV		"	1107	"	"	"	7.15	P F
CAL ICV CCV		"	"	"	"	"	9.45	P F
CAL ICV CCV		"	"	"	"	"	10.60	P F

41 - 100 NTU Std <u>100</u> NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	5/17/12	100	P F
CAL ICV CCV	"	106	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		5/17/12	0754	240±25	3354	06-2016	226.8/240	P F
CAL ICV CCV		"	1115	"	"	"	237.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU Std <u>800</u> NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV	5/17/12	817	P F
CAL ICV CCV	"	804	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

- 1. See Table FS 2200-2 on the back of this form
- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments:

qualified with
* Failed DO, CCV
* Failed pH, CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: F0 0552B Task: 17*0 Date: 5/17/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (___ Teflon ___ SS ___ Other) X Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: 70.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 0840 Time @ End of Purging: 0854 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.49 ft. BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 8.8 gal.

Screen: 35-42 ft. BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0840	Start	23.87	10.32	2.099	5.11	1.07	-280.7	2.96	1.359	clear	
0850	1.0	24.04	10.51	2.064	1.57	1.05	-308.8	1.57	1.342	"	
0852	1.2	24.05	10.52	2.077	2.11	1.06	-309.8	1.57	1.351	"	
0854	1.4	24.13	*10.54	2.090	1.31	1.07	-311.7	*1.58	1.352	"	
			* Failed pH					* Failed DO			
			qualified with CCV.					qualified with CCV.			
			JB					JB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20120517
 Sample ID: _____ Time Collected: 0854 Comments: VOL + nBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.32 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= - gal

$$0.041 \times 0.035 \times 47 + 0.25 = 0.32 \text{ gal}$$

Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 17th Date: 5/17/12 Sampled By: J. Bartlett

Station (Well ID): AW000B Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (___ Teflon ___ SS ___ Other) X Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): brapump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Ducham

Time @ Start of Purging: 0902 Time @ End of Purging: 0916 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 8.11 ft B70L Total Well Depth: 57 ft. BIS Reference: - Well diameter: 6 in. Volume in well: 94 gal.
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 Screen: 47-57 ft. BIS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0902	Start	23.91	10.51	2.580	1.17	1.32	-308.7	2.74	1.662	grey	
0912	1.0	23.84	10.69	2.466	1.83	1.27	-316.2	1.74	1.603	clear	
0914	1.2	23.85	10.69	2.464	2.42	1.27	-318.9	1.71	1.602	//	
0916	1.4	23.83	*10.69	2.466	2.35	1.27	-319.5	*1.55	1.603	//	
			qualified with					qualified with			
			*Failed pit CCV					*Failed DO CCV.			
			JB					JB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-AW000B-052.0-20120517 Time Collected: 0916 Comments: VOL + nBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.34 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal


$$0.041 \times 0.035 \times 62 + 0.25 = 0.34 \text{ gal}$$

Project: <u>LC34</u>	Date: <u>6/26/12</u>
Project No.: <u>FO 0552B</u>	Task No.: <u>10#1</u>
Contractors: _____	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <input checked="" type="checkbox"/>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
0700: J. Bartlett, D. Sizemore, R. Donahue at office. Calibrate instruments, load vehicle, travel to site
0830: on site. Shut recirc. system off. Begin sampling. For details, refer to Monitoring Well sampling forms.
1500: off site. Travel back to office
1530: Unload vehicles, load pack samples for shipment, Calibrate instruments. (CCV)
1730: End of day.

Plans/Future Activities

 6/26/12
 Signature/Date

Project: <u>F00552B g</u>	Date: <u>6/26/12</u>
Project No.: <u>LC34</u>	Task No.: <u>1841</u>
Contractors: <u>N/A</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>BW0001 A-F, IW0076</u> H2I
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern	
7:30 - met @ office + calibrated YSI + hatch	
8:10 - left office	
8:40 - arrived @ site	
8:50 - began purging	BW0001A *
9:22 - began purging	BW0001B *
10:16 - began purging	BW0001C *
10:50 - began purging	BW0001D *
11:26 - began purging	BW0001E *
11:55 - began purging	BW0001F *
12:20 - lunch	
13:10 - began purging	BW0001 ^{Red 6/25} IW0001 IW0076 *
13:55 - began purging	IW0002I *
15:00 - left site	

Plans/Future Activities
* = see sampling forms for sampling details.

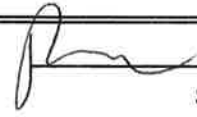
[Handwritten Signature]
Signature/Date

Project: <u>LRH</u>	Date: <u>01/27/12</u>
Project No.: <u>FO0552B</u>	Task No.: <u>1081</u>
Contractors: <u>N/A</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: <u>BW0003A*</u>
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
750 - arrive at office + Calibrate YSI + Hoeh
830 - leave office, get gas, travel to site
935 - began purging BW0003A*
1004 - began purging BW0003B*
1038 - began purging BW0003C*
1110 - began purging BW0003D*
1151 - began purging BW0003E*
1200 - lunch
1302 - began purging BW0003F*
1330 - began cleaning up, packing up car, disposed of IDW
1410 - sampled drum 188680
1420 - IDW QC checklist
1445 - left site
1630 - FedEx picked up coolers
1640 - calibration verification

Plans/Future Activities
* = See sampling form for sampling details

 01/27/12
Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: **LC34**

Project #: **FRO552B** Field Personnel: **R. Donahue**

Water Quality Meter - Model/Serial #: **VSI 556mps/05 F1342 AE**

Turbidimeter - Model/Serial #: **HACH 2100Q/11020C00757**

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		6/26/12	736	22.47	8.478	11.59 → 8.50	13.67 → 100.2	⊕ F
CAL ICV CCV		6/26/12	16:07	24.41	8.356	6.18	73.9	⊕ F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Std 10 NTU			
CAL ICV CCV	6/26/12	10.6	⊕ F
CAL ICV CCV	6/26/12	10.2	⊕ F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		6/26/12	805	1.413	9313	10-2012	1.248 - 1.413	⊕ F
CAL ICV CCV		6/26/12	1053	1.413	9313	10-2012	1.409	⊕ F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Std 20 NTU			
CAL ICV CCV	6/26/12	18.8	⊕ F
CAL ICV CCV	6/26/12	20.0	⊕ F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		6/26/12	740	4.0	1081960	8/30/13	4.66 → 4.00	⊕ F
CAL ICV CCV			747	7.0	011091A	11-2012	6.99 → 7.00	⊕ F
CAL ICV CCV			755	10.0	2101326	07-2012	9.99 → 10.0	⊕ F
CAL ICV CCV			1041	4.0	1081960	8-2013	4.12	⊕ F
CAL ICV CCV			1045	7.0	011091A	11-2012	6.82	⊕ F
CAL ICV CCV			1050	10.0	2101326	08-2013	9.55	⊕ F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Std 100 NTU			
CAL ICV CCV	6/26/12	102	⊕ F
CAL ICV CCV	6/26/12	102	⊕ F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		6/26/12	809	250 ± 25	2181	04-2010	245.5 → 240	⊕ F
CAL ICV CCV		6/26/12	1058	250 ± 25	2181	06-2010	239.4	⊕ F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Std 300 NTU			
CAL ICV CCV	6/26/12	823	⊕ F
CAL ICV CCV	6/26/12	777	⊕ F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings, always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: **100+ pH of 10 failed CCV**



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: J. Bartlett LC34 Project #: F0055213 Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556 MPS / 08A100777 Turbidimeter - Model/Serial #: HACH 2100Q / 11020607557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		6/26/12	0707	23.83	8450	832	18.45	P F
CAL ICV CCV		6/26/12	11046	25.48	8.203	5.45	66.6	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/26/12	9.40	P F
CAL ICV CCV		6/26/12	10.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		6/26/12	0710	1.413	9373	12-2012	1.167	P F
CAL ICV CCV		6/26/12	1755	1.413	9373	12-2012	1.074	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/26/12	19.7	P F
CAL ICV CCV		6/26/12	20.6	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		6/26/12	0717	4.0	0110969	11-2012	4.16	P F
CAL ICV CCV				7.0	1001820	08-2013	6.88	P F
CAL ICV CCV				10.0	2101326	07-2012	9.98	P F
CAL ICV CCV		6/26/12	11048	4.0	0110969	11-2012	3.94	P F
CAL ICV CCV				7.0	1001860	08-2013	6.80	P F
CAL ICV CCV				10.0	2101326	07-2012	9.97	P F

41 - 100 NTU	Std 60 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/26/12	94.4	P F
CAL ICV CCV		6/26/12	106	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		6/26/12	0714	240±25	2981	01-2016	256.6	P F
CAL ICV CCV		6/26/12	1700	240±25	2981	01-2016	233.6	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std 200 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/26/12	305	P F
CAL ICV CCV		6/26/12	784	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Comments: DO, conductivity T & P of 4.0 failed CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34 Project #: FO 0557 B Field Personnel: D. Szemora

Water Quality Meter - Model/Serial #: YSI 556 115101206 Turbidimeter - Model/Serial # _____

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		6/26/12	701	23.79	8.43	8.77-8.45	100.0	P F
CAL ICV CCV		6/26/12	1732	21.58	8.812	8.81	100.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		6/26/12	704	1.413	9373	12/12	1.324-1.412	P F
CAL ICV CCV		6/26/12	1745	1	..	n	1.419	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		6/26/12	709	4	0110969	11/12	4.04-4.00	P F
CAL ICV CCV			over 712	7	10819860	8/13	6.95-7.02	P F
CAL ICV CCV			716	10	2010326	7/12	10.12-10.02	P F
CAL ICV CCV		6/26/12	1733				4.14	P F
CAL ICV CCV			1734				7.72	P F
CAL ICV CCV			1735				10.14	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		6/26/12	719	240.25	3354	6/16	315.1-290.0	P F
CAL ICV CCV		6/26/12	1728	n	n	n	238.3	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV	1	6/26/12	1.4-1.0	P F
CAL ICV CCV	1	6/26/12	2.1	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		6/26/12	9.8-10.0	P F
CAL ICV CCV		6/26/12	9.9	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Comments: no fault, pH 7 CCV.
quality 7/24

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: F0552B

Field Personnel: R. Donahue

Water Quality Meter - Model/Serial #: YSI 556 MPS/05D 2373 AK

Turbidimeter - Model/Serial #: Hach 2100Q/11020C007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		6/27/12	6:158	23.50	8.499	8.09 → 8.0	95.0 → 100.0	P F
CAL ICV CCV		6/27/12	11041	23.50	7.890	0.64	84.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
Acceptance Criteria: +/- 0.3mg/L								
Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		6/27/12	7:12	1.413	9373	10-2012	1.392 → 1.413	P F
CAL ICV CCV		6/27/12	1650	1.413	9373	10-2012	1.530	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
Acceptance Criteria: +/- 5%								
pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		6/27/12	7:01	4.0	1091960	8-2012	3.97 → 4.01	P F
CAL ICV CCV				7.0	0110969	11-2012	6.94 → 7.00	P F
CAL ICV CCV				10.0	2101326	07-2012	10.19 → 10.13	P F
CAL ICV CCV		6/27/12	1448	4.0	1091960	8-2012	4.07	P F
CAL ICV CCV		6/27/12		7.0	0110969	11-2012	7.04	P F
CAL ICV CCV		6/27/12		10.0	2101326	07-2012	10.01	P F
Acceptance Criteria: +/- 0.2 SU								
ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		6/27/12	7:16	240mV	2981	01-2010	256.16 → 224.0	P F
CAL ICV CCV		6/27/12	1658	240mV	2981	01-2010	224.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
Geosyntec Acceptance Criteria: +/- 5%								
Specific Conductance Probe Cleaned? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Dissolved Oxygen membrane Changed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						

0.1 - 10 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/27/12	10.7	P F
CAL ICV CCV		6/27/12	10.7	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
Acceptance Criteria: +/- 10%				
11 - 40 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/27/12	20.1	P F
CAL ICV CCV		6/27/12	21.2	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
Acceptance Criteria: +/- 8%				
41 - 100 NTU	Std 80 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/27/12	102	P F
CAL ICV CCV		6/27/12	101	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
Acceptance Criteria: +/- 6.5%				
>100 NTU	Std 600 NTU	Date	Reading (NTU)	Pass or Fail
CAL ICV CCV		6/27/12	709	P F
CAL ICV CCV		6/27/12	741	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
Acceptance Criteria: +/- 5%				

Comments: * Failed DO, Conductivity CCV. is qualified



Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1311 Time @ End of Purging: 1326 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 5.41 ft BTOC Total Well Depth: 42 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 62 gal.
 Screen: 35 - 42 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1311	Start	26.53	7.44	1.972	6.63	1.00	-285.9	2.84	1.291	clear	
1321	1.0	26.40	7.12	2.044	3.79	1.04	-272.9	0.48	1.329	"	
1323	1.2	26.50	7.11	2.054	2.12	1.04	-275.7	0.38	1.337	"	
1326	1.5	26.69	7.12*	2.067*	3.14	1.05	-285.5	0.33*	1.345	"	
											qualified w/
											* DO method CCV
			* pH 4								qualified w/
											* Cond. method CCV

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-2012-0626
 Sample ID: _____ Time Collected: 1326 Comments: VOC & nBA, TOC, MEE, DHC & VCRA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.37 gal

47 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): FW0002E Purge Method: Pump Bailer Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.11 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1355 Time @ End of Purging: 1409 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 027.5 ft. (BTOC)

Water Level: 5.61 ft BTOC Total Well Depth: 30 ft. BLS Reference: - Well diameter: 2 in. Volume in well: 4.9 gal
 Screen: 25-30 ft. BLS
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1355	Start	-	-	-	-	-	-	-	-	-	
1405	1.0	25.28	6.87	0.572	4.58	0.28	-61.6	0.32	0.373	clear	
1407	1.2	25.30	6.67	0.586	2.93	0.28	-66.6	0.32	0.381	"	
1409	1.4	25.26	6.86	0.595 *	3.16	0.29	-80.4	0.32*	0.387	"	
				<i>qualified w/</i>				<i>qualified w/</i>			
				* Cond. <i>failed</i> CCV				* DO <i>failed</i> CCV			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-FW0002E-027.5-20120626
 Sample ID: _____ Time Collected: 1414 Comments: VOC, nPDA, TOC, MGC

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.30 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: D. Sorenson

Station (Well ID): IW0002D Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 1400 Time @ End of Purging: 1419 Total Purging Time: 19 min Depth of Pump or Intake Tubing: 037.5 ft. (BTOC)

Water Level: 5.87 ft BTOC Total Well Depth: 40 ft BLS Reference: - Well diameter: 2 in. Volume in well: 6.5 gal
 Screen: 35.40 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1400	Start, .5	25.45	7.65	.804	6.1	.39	-279.4	.46	.52	Clear	---
1413	1.0	25.46	7.35	.872	6.3	.43	-284.5	.58	.59	"	---
1416	1.3	25.32	7.33	.879	7.5	.47	-293.7	.30	.60	"	---
1419	1.6	25.32	7.32	.880	6.5	.48	-307.0	.24	.60	"	---

qualitative
 * pH 7 ~~failed~~ CCV
 JS

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0002D-037.5-2012 0826
 Sample ID: _____ Time Collected: 1419 Comments: VOC 1/4 n BA, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 4 gal

(.0026 x 40) x .3 = .3

Monitoring Well Sampling

Site: LC34 Project No.: F0 0552B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): BW0001A Purge Method: (Pump) Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556MPS Water Level Meter: for ham

Time @ Start of Purging: 850 Time @ End of Purging: 906 Total Purging Time: 14 min. Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.13 ft BTOC Total Well Depth: 26 ft BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 0.52 gal
 Screen: 23-26 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
850	Start	—	—	—	—	—	—	—	—	—	
900	1.0	23.94	6.85	0.697	4.25	0.34	-95.4	0.67	0.453	clear	
902	1.2	24.00	6.91	0.698	2.56	0.34	-115.1	0.64	0.454	clear	
904	1.4	24.02	6.91*	0.698	1.09	0.34	-116.1	0.60*	0.454	clear	
				qualified by				qualified by			
			* pH 10	failed CCV				* DO failed	CCV		
			JB					JB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001A-024.5-20120626 Time Collected: 906 Comments: VOC & nBA, TOC, MEE

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.29 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

↳ only 2 vials (one broke)

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: P. Donahue

Station (Well ID): BW0001B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 550MPS Water Level Meter: Durham

Time @ Start of Purging: 922 Time @ End of Purging: 941 Total Purging Time: 1.9 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.05 H BTOC Total Well Depth: 33 A. BLS Reference: - Well diameter: 3.4 in. Volume in well: 0.66 gal.

Screen: 30-33 A. BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
922	Start	—	—	—	—	—	—	—	—	—	
932	1.0	24.10	7.12	0.818	4.77	0.40	-131.5	0.20	0.532	clear	
937	1.5	24.14	7.04	0.818	0.82	0.40	-122.3	0.22	0.532	clear	
941	1.9	24.15	7.06*	0.820	0.72	0.40	-118.7	0.24*	0.533	clear	
				qualified by				qualified by			
			* pH 10	Partial CCU				* DO failed	CCU		
			SB					SB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001B - 081.5 - 2012 0626 945 Comments: NOC & nBA, TOC, MSL

Sample ID: _____ Time Collected: 945 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.20 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 01/20/12 Sampled By: R. D. Sma hve

Station (Well ID): BW0001C Purge Method: Pump Bailer Pump Type: Submersible (SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 mps Water Level Meter: Durham
 Time @ Start of Purging: 10:16 Time @ End of Purging: 10:31 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)
 Water Level: 8.07 ft BTOC Total Well Depth: 40 ft BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.80 gal
 Screen: 37-40 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>10:16</u> end <u>10:03</u> start	Start	-	-	-	-	-	-	-	-	-	
<u>10:23</u>	<u>1.0</u>	<u>24.51</u>	<u>6.73</u>	<u>1.398</u>	<u>1.05</u>	<u>0.70</u>	<u>-162.5</u>	<u>0.16</u>	<u>0.913</u>	<u>clear</u>	
<u>10:29</u>	<u>1.3</u>	<u>24.52</u>	<u>6.72</u>	<u>1.439</u>	<u>0.63</u>	<u>0.72</u>	<u>-166.2</u>	<u>0.17</u>	<u>0.939</u>	<u>clear</u>	
<u>10:31</u>	<u>1.5</u>	<u>24.50</u>	<u>6.72*</u>	<u>1.454</u>	<u>0.62</u>	<u>0.73</u>	<u>-167.4</u>	<u>0.16*</u>	<u>0.957</u>	<u>clear</u>	
				<u>qualified by</u>				<u>qualified by</u>			
			<u>* pH</u>	<u>10 failed CCV</u>				<u>* DO</u>	<u>failed CCV</u>		
				<u>JB</u>				<u>JB</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001C-038.5-2012-0126 Time Collected: 10:35 Comments: VOC & nPBA, TOC, MEZ, Dinc & VCA.
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.31 gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): BW0001D Purge Method: Pump Bailer Pump Type: Submersible (SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YS1556MPS Water Level Meter: Durham

Time @ Start of Purging: 1050 Time @ End of Purging: 1111 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 3.01 A BTOC Total Well Depth: 47 A-BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Screen: 44-47 A-BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1050	Start	—	—	—	—	—	—	—	—	—	
1107	1.7	24.47	6.81	2.663	1.49	1.38	-222.3	0.26	1.731	clear	
1109	1.9	24.48	6.86	2.665	1.42	1.38	-221.3	0.17	1.733	clear	
1111	2.1	24.52	6.85*	2.665	0.47	1.38	-222.0	0.16*	1.732	clear	
				qual. P. ed w/ JS				qual. P. ed w/ JS			
			*pH 10 failed CCV					*DO failed CCV			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001D-045.5-2012 0626 Time Collected: 1115 Comments: VOL & nPA, TOC, MSL

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.37 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: D. Siemore

Station (Well ID): BW0002A Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSF 556 Water Level Meter: Durham

Time @ Start of Purging: 1227 Time @ End of Purging: 1234 Total Purging Time: 7 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.78 ft BTOC Total Well Depth: 26 ft BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.52 gal

Screen: 23-26 ft BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1234	Start	25.07	7.35	.684	3.0	.33	-196.5	.25	.44	Clear	—
1241	1.0	25.04	7.35	.684	3.1	.33	-191.3	.25	.44	"	—
1248	1.5	25.04	7.35	.684	2.7	.33	-188.9	.23	.44	"	—

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002A-024.5-20120626 Time Collected: 1248 Comments: VOC, SWBA, TOC, MGC

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 4 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 4 gal

6026-26 + .3

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/20/12 Sampled By: D. Sizemore

Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 1151 Time @ End of Purging: 1212 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.59 A BTOC Total Well Depth: 33 A.BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.66 gal
 Screen: 30-33 A.BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1158	Start .5	25.23	7.47	.699	6.2	.34	-246.7	.23	.46	Clean	—
1205	1.0	25.17	7.46	.702	2.5	.34	-230.7	.21	.46	"	—
1212	1.5	25.16	7.46*	.704	2.0	.34	-252.7	.20	.46	"	—
				qualified by							
			*pH 7	CCV							
			SB								

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002B - 031.5 - 2012 0626 Time Collected: 1212 Comments: VOL 4 n BA, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = .4 gal

(.0026 * 33) + .3 =

Monitoring Well Sampling

Site: LC 34 Project No.: F0 0552B Task: 18*1 Date: 6/26/12 Sampled By: P. Sizemore

Station (Well ID): BW 0002 C Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YS556 Water Level Meter: Durham

Time @ Start of Purging: 1102 Time @ End of Purging: 1123 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.01 H BTOC Total Well Depth: 40 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.80 gal
 Screen: 37-40 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1109	Start .5	26.14	7.23	2.137	2.3	1.09	-354.1	.30	1.38	Clear	-
1116	1.0	26.04	7.28	2.109	2.4	1.09	-364.0	.20	1.38	4	-
1123	1.5	26.00	7.28	2.110	2.4	1.09	-364.2	.19	1.35	4	-

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002C-038.5-2012 0626
 Sample ID: _____ Time Collected: 1123 Comments: VOC & nBA, TOC, MGC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.4 gal
(.0026 * 40) + (.3)

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 10/26/12 Sampled By: P. Sizemore

Station (Well ID): BW 0002D Purge Method: Pump Bailer _____ Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 55C Water Level Meter: Durham

Time @ Start of Purging: 1023 Time @ End of Purging: 1044 Total Purging Time: 21min Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 5.89 A BTOC Total Well Depth: 47 A.BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Screen: 44-47 A.BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1030	Start .5	25.97	7.24	2.582	10.0	1.33	-323.3	.25	1.68	Clear	—
1037	1.0	26.03	7.28	2.583	9.2	1.31	-352.3	.09	1.65	"	—
1044	1.5	25.99	7.30*	2.582	4.3	1.30	-301.1	.10	1.65	"	—
				qualified by							
			* pH 7.27	CCU							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002D-045.5-2012 06 20 Time Collected: 1044 Comments: VOC & nBA, TOC, MGC

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = .4 gal

(.0026 * 47) + (.3)

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 18*1 Date: 10/27/12 Sampled By: R. Donahue

Station (Well ID): BW0003A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 mps Water Level Meter: durham

Time @ Start of Purging: 935 Time @ End of Purging: 949 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.22 ft BTOC Total Well Depth: 26 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.52 gal
 Screen: 23-26 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
935	Start	—	—	—	—	—	—	—	—	—	
945	1.0	24.55	7.52	0.713	0.101	0.35	-173.3	0.63	0.463	clear	
947	1.2	24.53	7.52	0.713	0.570	0.35	-170.8	0.61	0.464	clear	
949	1.4	24.54	7.52*	0.713*	0.36	0.35	-174.7	0.61*	0.464	clear	
			OK * pH 7	failed CCV				qual. field w/			* DO failed CCV
				qualified w/				JB			
				* Cond. failed CCV							
				JB							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes: Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003A-024.5-20120627 Time Collected: 955 Comments: VOC & nBA, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.24 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.33 gal

Monitoring Well Sampling

Site: LC34 Project No.: F0 0552B Task: 18*1 Date: 6/27/12 Sampled By: R. Donahue

Station (Well ID): hw0003B Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YS1556 mps Water Level Meter: Duham

Time @ Start of Purging: 1004 Time @ End of Purging: 1010 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 5.37 ft BTOC Total Well Depth: 33 ft BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.66 gal
 Screen: 30-33 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1004</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>1010</u>	<u>1.0</u>	<u>24.44</u>	<u>7.54</u>	<u>0.728</u>	<u>0.52</u>	<u>0.35</u>	<u>-174.5</u>	<u>0.20</u>	<u>0.473</u>	<u>clear</u>	
<u>1010</u>	<u>1.2</u>	<u>24.44</u>	<u>7.54</u>	<u>0.728</u>	<u>0.49</u>	<u>0.35</u>	<u>-167.4</u>	<u>0.20</u>	<u>0.473</u>	<u>clear</u>	
<u>1010</u>	<u>1.4</u>	<u>24.43</u>	<u>7.54*</u>	<u>0.728*</u>	<u>0.49</u>	<u>0.35</u>	<u>-149.3</u>	<u>0.21*</u>	<u>0.473</u>	<u>clear</u>	
			<u>DL * pH = failed CCV</u>					<u>qualified by</u>			
				<u>* Cond. failed CCV</u>				<u>* DO failed CCV</u>			
				<u>qualified by JS</u>				<u>JS</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-hw0003B-031.5-2012 0627 Time Collected: 1022 Comments: VOC & nBA, TOC, MSE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.20 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.35 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 18*1 Date: 10/27/12 Sampled By: R. Donahue

Station (Well ID): BW 0003C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model): YS1556 mps Water Level Meter: Durham

Time @ Start of Purging: 1038 Time @ End of Purging: 1052 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 5.4 ft BTOC Total Well Depth: 40 ft BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.80 gal
 Screen: 37-40 ft BLS
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1038</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>1048</u>	<u>1.0</u>	<u>24.63</u>	<u>7.61</u>	<u>1.060</u>	<u>0.67</u>	<u>0.52</u>	<u>-266.2</u>	<u>0.57</u>	<u>0.691</u>	<u>clear</u>	
<u>1050</u>	<u>1.2</u>	<u>24.58</u>	<u>7.61</u>	<u>1.076</u>	<u>0.52</u>	<u>0.53</u>	<u>-248.4</u>	<u>0.37</u>	<u>0.701</u>	<u>clear</u>	
<u>1052</u>	<u>1.4</u>	<u>24.58</u>	<u>7.61</u>	<u>1.091</u> *	<u>0.48</u>	<u>0.54</u>	<u>-248.4</u>	<u>0.30</u> *	<u>0.710</u>	<u>clear</u>	
				<i>qualified by</i>				<i>qualified by</i>			
				<i>* Cond. failed CCV</i>				<i>* DO failed CCV</i>			
				<i>JB</i>				<i>JB</i>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003C-038.5-20120627 Time Collected: 1056 Comments: VOC & nBAs, TOC, MEE, DHC & VER A.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.37 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.37 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/27/12 Sampled By: R Donahue

Station (Well ID): BW 0003D Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1110 Time @ End of Purging: 1126 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 5.22 H BTOC Total Well Depth: 47 H.BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.94 gal
 Screen: 44-47 H.BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1110	Start	—	—	—	—	—	—	—	—	—	
1120	1025	25.19	6.95	2.399	5.86	1.23	-318.8	0.82	1.562	clear	
1122	1.2	25.12	7.14	2.914	3.06	1.24	-332.1	0.69	1.567	clear	
1124	1.4	25.12	7.24	2.413	3.29	1.24	-339.3	0.60	1.570	clear	
1126	1.6	25.05	7.28	2.417 *	2.82	1.24	-348.2	0.56*	1.571	clear	
				qualified by				qualified by			
				* Cond. - tested	CCV			* DO - tested	CCV		
				JB				JB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW 0003D - 045.5 - 2012 0627 1135 Comments: VOC & nBA, TOC, MSE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.32 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.39 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bertlett

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1401 Time @ End of Purging: 1416 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 5.61 ft BTOC Total Well Depth: 57 ft. BLS Reference: _____ Well diameter: 6 in. Volume in well: 8.4 gal.
 Screen: 47-57 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1401	Start	26.12	7.40	2.676	3.65	1.38	-276.8	2.23	1.735	clear	
1401	1.0	25.67	7.05	2.653	2.38	1.37	-268.0	0.50	1.725	"	
1413	1.2	25.57	7.07	2.664	2.42	1.37	-269.9	0.43	1.732	"	
1416	1.5	25.48	7.07*	2.695*	2.52	1.39	-269.5	0.38*	1.753	"	
				qualified w/				qualified w/			
			*pH 4	not CCV				*DO failed			
				JB qualified w/				JB			
				*Cond failed							
				JB							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart. must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-2012 0626 Time Collected: 1416 Comments: VOC & nBA, TOC, MGC, Phc & VOA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.41 gal
 62 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: D. Siremon

Station (Well ID): FW0002D1 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 550 Water Level Meter: Durham
 Time @ Start of Purging: 1315 Time @ End of Purging: 1333 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)
 Water Level: 10.30 H BTOC Total Well Depth: 55 ft. BLS Reference: - Well diameter: 2 in. Volume in well: 8.9 gal
 Screen: 50-55 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1322	Start .5	25.43	7.35	2.365	8.2	1.21	-358.1	.42	1.54	clear	—
1329	1.0	25.38	7.30	2.369	2.0	1.23	-360.1	.32	1.56	2	—
1333	1.3	25.47	7.24	2.370	2.3	1.23	-363.5	.27	1.56	4	—

qualified by
 * pH 7 tested CCV
 JS

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however. DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

U34-FW0002D1-052.5-2012 0626 1333 Comments: VOC, nBA, TOC, M42
 Sample ID: _____ Time Collected: 1333
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .4 gal
 (10026 * 55) / 4 = 3

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): BW0001E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model): YSI 556 mps Water Level Meter: cham

Time @ Start of Purging: 1126 Time @ End of Purging: 1240 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 5.52 ft BTOC Total Well Depth: 54 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.08 gal
 Screen: 51-54 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1126	Start	—	—	—	—	—	—	—	—	—	—
1130	1.0	24.73	7.24	2.385	4.23	1.22	-219.1	0.20	1.550	clear	
1138	1.2	24.67	7.20	2.385	2.34	1.22	-218.5	0.20	1.550	clear	
1140	1.4	24.64	7.13*	2.385	1.42	1.22	-214.8	0.21*	1.550	clear	
				qualified by				qualified by			
			* pH 10	failed CCU				* DO failed	CCU		
				SB				SB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001E-052.5-2012 0626 Time Collected: 1245 Comments: VOC 3 nBA, TOC, MS6, DOC & UREA.

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.33 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): BW0001F Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1155 Time @ End of Purging: 1209 Total Purging Time: 14 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 6.00 ft BTOC Total Well Depth: 61 ft. BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 1.22 gal
 Screen: 58-61 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1155</u>	<u>Start</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>1205</u>	<u>1.0</u>	<u>24.106</u>	<u>7.07</u>	<u>2.436</u>	<u>1.42</u>	<u>1.25</u>	<u>-169.3</u>	<u>0.27</u>	<u>1.584</u>	<u>clear</u>	
<u>1207</u>	<u>1.2</u>	<u>24.104</u>	<u>7.06</u>	<u>2.437</u>	<u>0.75</u>	<u>1.25</u>	<u>-168.4</u>	<u>0.26</u>	<u>1.584</u>	<u>clear</u>	
<u>1209</u>	<u>1.4</u>	<u>24.65</u>	<u>7.05*</u>	<u>2.438</u>	<u>0.62</u>	<u>1.25</u>	<u>-166.5</u>	<u>0.27*</u>	<u>1.584</u>	<u>clear</u>	
				<u>qualified w/</u>				<u>qualified w/</u>			
			<u>*pH 10</u>	<u>faulted CCU</u>				<u>*DO faulted CCU</u>			
				<u>TB</u>				<u>TB</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0001F-059.5-2012 0626 Time Collected: 1213 Comments: VOC & nBA, TOC, MGC.

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 0.34 gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 18*1 Date: 6/24/12 Sampled By: D.S. Ziemer

Station (Well ID): BW0002E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 07 gpm Water Quality Meter (Make & Model): YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 939 Time @ End of Purging: 1000 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 6.03 H BTOC Total Well Depth: 54 A.BLS Reference: FO 13 Well diameter: 3/4 in. Volume in well: 1.08 gal

Screen: 51-54 A.BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
946	Start	25.10	7.42	2.386	2.4	1.23	-269.4	.15	1.56	Clear	—
953	1.0	25.19	7.62	2.394	2.5	1.26	-268.1	.15	1.59	4	—
1000	1.5	25.14	7.61*	2.397	1.3	1.26	-274.0	.15	1.60	4	—
				qualified by							
			* pH 7	CCV							
			JS								

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002E - 052.5 - 20120226

Sample ID: _____ Time Collected: 1000 Comments: VOC AnBA, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = .14 gal

(.0026 * 54) + (.3)

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/20/12 Sampled By: D. Sizeman

Station (Well ID): BW0002F Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Geopump Purge Rate: 0.7 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 856 Time @ End of Purging: 917 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 6.12 ft BTOC Total Well Depth: 61 ft. BIS Reference: JCL Well diameter: 3/4 in. Volume in well: 1.22 gal
 Screen: 58-61 ft. BIS
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
903	Start	24.84	7.54	2.531	0.7	1.30	-271.4	.14	1.65	Clear	
910	1.0	24.77	7.56	2.528	1.1	1.30	-275.7	.12	1.64	"	
917	1.5	24.80	*7.57	2.525	1.7	1.30	-257.5	.12	1.64	"	
				qualified w/							
			*pH 7	parted CCV							
				JB							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes: Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0002F-059.5-20120620 Time Collected: 917 Comments: VOC & nBA, TOC, MEE

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .5 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/27/12 Sampled By: R. Donahue

Station (Well ID): BW0003E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: clu/ham

Time @ Start of Purging: 1151 Time @ End of Purging: 1246 Total Purging Time: 55min Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 7.66 ft BTOC Total Well Depth: 54 ft BLS Reference: _____ Well diameter: 3/4 in. Volume in well: 1.08 gal

Screen: 51-54 ft BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1151</u>	Start	—	—	—	—	—	—	—	—	—	
<u>1238</u>	<u>4.7</u>	<u>25.23</u>	<u>7.46</u>	<u>2.409</u>	<u>1.06</u>	<u>1.34</u>	<u>-291.4</u>	<u>0.96</u>	<u>1.693</u>	<u>clear</u>	
<u>1240</u>	<u>4.9</u>	<u>25.23</u>	<u>7.47</u>	<u>2.606</u>	<u>0.82</u>	<u>1.34</u>	<u>-288.3</u>	<u>1.49</u>	<u>1.694</u>	<u>clear</u>	
<u>1242</u>	<u>5.1</u>	<u>25.04</u>	<u>7.45</u>	<u>2.602</u>	<u>0.99</u>	<u>1.34</u>	<u>-267.4</u>	<u>0.99</u>	<u>1.692</u>	<u>clear</u>	
<u>1244</u>	<u>5.3</u>	<u>24.98</u>	<u>7.42</u>	<u>2.600</u>	<u>0.78</u>	<u>1.34</u>	<u>-287.7</u>	<u>0.80</u>	<u>1.690</u>	<u>clear</u>	
<u>1246</u>	<u>5.5</u>	<u>24.96</u>	<u>7.37</u>	<u>2.597*</u>	<u>0.95</u>	<u>1.34</u>	<u>-289.0</u>	<u>0.70*</u>	<u>1.687</u>	<u>clear</u>	
				<u>qualified by</u>				<u>qualified by</u>			
				<u>* Cond. certified CCV</u>				<u>* DO certified CCV</u>			
				<u>JB</u>				<u>JB</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003E-052.5-2012 0627

Sample ID: _____ Time Collected: 1250 Comments: VOC & ABA, TOL, MEE, DHC & verA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.33 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.41 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 18*1 Date: 6/27/12 Sampled By: R. Donahue

Station (Well ID): BW0003F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): YSI 550 MPS Water Level Meter: Durham

Time @ Start of Purging: 1302 Time @ End of Purging: 1318 Total Purging Time: 16min Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 5.71 ft BTOC Total Well Depth: 61 ft BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.22 gal
 (collected @ 910 on 6/27/12) screen: 58-61 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1302</u>	Start	—	—	—	—	—	—	—	—	—	—
<u>1314</u>	<u>1.2</u>	<u>25.24</u>	<u>7.51</u>	<u>2.572</u>	<u>1.00</u>	<u>1.33</u>	<u>-297.9</u>	<u>0.28</u>	<u>1.677</u>	<u>clear</u>	
<u>1316</u>	<u>1.4</u>	<u>25.11</u>	<u>7.52</u>	<u>2.588</u>	<u>0.83</u>	<u>1.33</u>	<u>-289.3</u>	<u>0.31</u>	<u>1.693</u>	<u>clear</u>	
<u>1318</u>	<u>1.6</u>	<u>25.08</u>	<u>7.54</u>	<u>2.593*</u>	<u>1.13</u>	<u>1.34</u>	<u>-294.6</u>	<u>0.33*</u>	<u>1.686</u>	<u>clear</u>	
				<u>qualified by</u>				<u>qualified by</u>			
				<u>* Cond. certified CCV</u>				<u>* DO certified CCV</u>			
				<u>JB</u>				<u>JB</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-BW0003F-059.5-2012 0627 Time Collected: 1328 Comments: VOL 1/2 BA, TOC, MEE

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.34 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.43 gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: R. Donahue

Station (Well ID): IW0076 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YS1556MPS Water Level Meter: clurham

Time @ Start of Purging: 1310 Time @ End of Purging: 1328 Total Purging Time: 18 min Depth of Pump or Intake Tubing: 075.0 ft. (BTOC)

Water Level: 6.62 ft BTOC Total Well Depth: 80 ft BLS Reference: _____ Well diameter: 2 in. Volume in well: 13.0 gal
 Screen: 70-80 ft BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1310	Start	—	—	—	—	—	—	—	—	—	
1322	1.2	27.41	6.52	2.265	4.30	1.15	-218.7	0.52	1.473	clear	
1324	1.4	28.01	6.49	2.290	6.06	1.17	-211.1	0.60	1.409	clear	
1326	1.6	28.13	6.52	2.317	5.05	1.18	-215.9	0.58	1.513	clear	
1328	1.8	28.15	6.61*	2.337	5.89	1.21	-207.3	0.48*	1.547	clear	
				qualified by				qualified by			
			* pH 10	calibrated CCV				* DO calibrated CCV			
				JB				JB			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0076-075.0-2012 June Time Collected: 1333 Comments: VOC & nBA, TOL, MGC

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = 0.37 gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = _____ gal

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bartlett

Station (Well ID): IW0067D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1155 Time @ End of Purging: 1210 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 5.88 ft BTOC Total Well Depth: 43 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.86 gal

Screen 3B-43 A.BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1155</u>	<u>Start</u>	<u>25.77</u>	<u>7.45</u>	<u>2.662</u>	<u>124</u>	<u>1.37</u>	<u>-223.9</u>	<u>1.64</u>	<u>1.730</u>	<u>cloudy</u>	
<u>1205</u>	<u>1.0</u>	<u>25.55</u>	<u>7.52</u>	<u>2.655</u>	<u>5.10</u>	<u>1.37</u>	<u>-282.4</u>	<u>0.24</u>	<u>1.726</u>	<u>clear</u>	
<u>1207</u>	<u>1.2</u>	<u>25.51</u>	<u>7.52</u>	<u>2.659</u>	<u>3.52</u>	<u>1.37</u>	<u>-293.6</u>	<u>0.21</u>	<u>1.729</u>	<u>"</u>	
<u>1210</u>	<u>1.5</u>	<u>25.51</u>	<u>7.52*</u>	<u>2.664*</u>	<u>3.01</u>	<u>1.37</u>	<u>-297.7</u>	<u>0.17*</u>	<u>1.732</u>	<u>"</u>	
				<u>qualified w/ JS</u>							
			<u>* pH 4</u>	<u>qualified w/ JS</u>				<u>qualified w/ JS</u>			
				<u>* Cond. qualified w/ JS</u>				<u>* DO qualified w/ JS</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0067D-040.5-2012 0626 Time Collected: 1210 Comments: VOC & nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.37 gal

40 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: F0 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bartlett

Station (Well ID): JW 0067D1 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1059 Time @ End of Purging: 1139 Total Purging Time: 39 min Depth of Pump or Intake Tubing: 068.0 ft. (BTOC)

Water Level: 5.81 A BTOC Total Well Depth: 73 A.BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal
 Screen: 63-73 A.BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1059	Start	25.22	7.43	2.637	>1000	1.36	-150.1	2.10	1.720	white	
1109	1.0	25.21	7.43	2.660	757	1.37	-126.6	0.27	1.729	"	
1120	2.0	25.09	7.41	2.664	258	1.37	-136.9	0.14	1.731	cloudy	
1130	3.0	25.05	7.40	2.665	94.9	1.38	-142.8	0.12	1.732	"	
1135	3.5	25.20	7.41	2.670	127	1.38	-148.8	0.13	1.736	"	
1137	3.7	25.21	7.41	2.669	128	1.38	-147.4	0.13	1.735	white cloudy	
1139	3.9	25.23	7.41*	2.670*	125	1.38	-146.1	0.14*	1.736	"	
			qualified w/ JS						qualified w/ JS		
			* pH 4 JS	* Conduct. failed CCV JS	turbidity not dropping ± 5 NTU.				* DO failed CCV JS		

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-JW0067D1-0680-2012-0626 Time Collected: 1139 Comments: VOL & nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.145 gal

78 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bartlett

Station (Well ID): IW0070D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) Ysi 556 MPS Water Level Meter: Soil mt
 Time @ Start of Purging: 0923 Time @ End of Purging: 0938 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)
 Water Level: 4.83 ft BTOC Total Well Depth: 43 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.86 gal
 Screen: 38-43 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>0923</u>	Start	<u>25.43</u>	<u>7.41</u>	<u>2.429</u>	<u>111</u>	<u>1.25</u>	<u>-211.9</u>	<u>1.83</u>	<u>1.600</u>	<u>cloudy</u>	
<u>0933</u>	<u>1.0</u>	<u>25.50</u>	<u>7.50</u>	<u>2.686</u>	<u>12.7</u>	<u>1.39</u>	<u>-270.6</u>	<u>0.35</u>	<u>1.746</u>	<u>clear</u>	
<u>0935</u>	<u>1.2</u>	<u>25.52</u>	<u>7.50</u>	<u>2.695</u>	<u>7.51</u>	<u>1.39</u>	<u>-275.8</u>	<u>0.36</u>	<u>1.753</u>	<u>"</u>	
<u>0938</u>	<u>1.5</u>	<u>25.40</u>	<u>7.49</u>	<u>2.714</u> *	<u>3.83</u>	<u>1.40</u>	<u>-280.8</u>	<u>0.42</u> *	<u>1.765</u>	<u>"</u>	
				<u>qualified w/ JS</u>							
			<u>* pH 4</u>	<u>Controlled CCV</u>				<u>qualified w/ JS</u>			
				<u>* Cond. Controlled CCV</u>				<u>* DO Controlled CCV</u>			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0070D-040.5-2012 0626 Time Collected: 0938 Comments: VOC & nB/A

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.38 gal

48 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Bartlett

Station (Well ID): IW 0070D1 Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 550 MPS Water Level Meter: Solinet

Time @ Start of Purging: 0851 Time @ End of Purging: 0908 Total Purging Time: 17 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)

Water Level: 5.75 ft BTOC Total Well Depth: 75 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal

Screen: 65-75 ft. BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
0851	Start	25.52	7.31	1.571	43.6	0.82	-138.7	2.93	1.157	clear	
0901	1.0	25.16	7.39	1.683	5.40	1.37	-106.0	0.41	1.724	"	
0906	1.5	25.06	7.41	2.686	3.66	1.39	-92.3	0.42	1.746	"	
0908	1.7	25.04	7.42*	2.693*	3.11	1.39	-90.1	0.42*	1.751	"	
				qualified w/ JS							
			* pH 4	qualified w/ JS							
				qualified w/ JS				* DO			
				* Cond. qualified w/ JS							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0070D1-070.0-2012-0626 Time Collected: 0908 Comments: VOC & nPBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.96 gal

80 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Berthelt

Station (Well ID): IW 0071D Purge Method: (Pump) Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MFS Water Level Meter: Solinst

Time @ Start of Purging: 1001 Time @ End of Purging: 1016 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 040.5 ft. (BTOC)

Water Level: 2.99 H BTOC Total Well Depth: 43 A. BLS Reference: - Well diameter: 3/4 in. Volume in well: 0.866 gal
 Screen: 38-43 A. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1001	Start	24.28	7.41	2.283	16.0	1.18	-201.7	1.62	1.526	clear	
1011	1.0	24.02	7.41	2.493	1.07	1.28	-241.2	0.15	1.621	"	
1013	1.2	24.01	7.41	2.494	1.23	1.28	-246.2	0.14	1.621	"	
1016	1.5	24.02	7.42*	2.493*	1.57	1.28	-241.9	0.13*	1.621	"	
				qualified w/							
			* pH 4	qualified w/				qualified w/			
				DO				* DO			
				qualified w/							
				* Cond. failed CCV							
				JD							

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW 0071D - 640.5 - 2012 0626 Time Collected: 1016 Comments: VOC & nBA

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.38 gal

48 0.25

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552B Task: 18*1 Date: 6/26/12 Sampled By: J. Burtlett

Station (Well ID): IW 0071D1 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Solinst
 Time @ Start of Purging: 1026 Time @ End of Purging: 1041 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 070.0 ft. (BTOC)
 Water Level: 3.52 ft BTOC Total Well Depth: 73 ft. BLS Reference: - Well diameter: 3/4 in. Volume in well: 1.5 gal
 Screen: 63-73 ft. BLS Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1026	Start	24.35	7.49	1.782	74.2	0.95	-187.2	3.45	1.305	cloudy	
1036	1.0	24.05	7.42	2.628	2.24	1.36	-167.9	0.18	1.709	clear	
1038	1.2	24.05	7.42	2.630	2.17	1.36	-161.2	0.16	1.710	"	
1041	1.5	24.04	7.42*	2.633*	1.58	1.36	-150.6	0.15*	1.712	"	
				qualified w/							
			* pH 4	qualified w/				qualified w/			
				* Cond. qualified w/				* DO qualified w/			

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-IW0071D1-070.0-20120626 Time Collected: 1041 Comments: DOC & nBA.

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.45 gal

78 0.25

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: PO 0526

Field Personnel: J. Beartlett

Water Quality Meter - Model/Serial #: YS 556 MRS / 10K101388

Turbidimeter - Model/Serial #: LaMotte 2020e / ^{JS} M44 MC 13571

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		7/19/12	0802	22.71	8.627	8.20/8.03	94.8/100.0	P F
CAL ICV CCV		7/19/12	1330	22.97	8.578	8.72	101.2	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		7/19/12	0819	1.413	9569	03-2013	1.417/1.413	P F
CAL ICV CCV		7/19/12	1312	4.56-4.05	2358	"	1.414	P F
CAL ICV CCV				"	"	"		P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		7/19/12	0805	4.0	2110380	04-2013	4.01/4.00	P F
CAL ICV CCV				7.0	2002046	01-2014	7.04/7.00	P F
CAL ICV CCV				10.0	2111265	04-2013	9.89/9.98	P F
CAL ICV CCV		7/19/12	1302				4.02	P F
CAL ICV CCV				"	"	"	7.01	P F
CAL ICV CCV							9.91	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		7/19/12	0822	240.25	3717	11-2016	243.4/240.0	P F
CAL ICV CCV		7/19/12	1315	"	"	"	237.6	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV	1 NTU	7/19/12	0.5/0.2	P F
CAL ICV CCV	"	"	0.95	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV	10 NTU	7/19/12	10.57/10.0	P F
CAL ICV CCV	"	"	9.90	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Comments: _____

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 12*0 Date: 7/19/12 Sampled By: J. Bertlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 20.1 gpm Water Quality Meter (Make & Model): YSI 556 MPD Water Level Meter: Solinst

Time @ Start of Purging: 1008 Time @ End of Purging: 1024 Total Purging Time: 16 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 6.21 ft. BTOC Total Well Depth: 92 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 62 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
 screen: 35.42 ft. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1008	Start	25.77	7.46	1.964	0.68	1.00	-245.1	1.60	1.276	clear	
1018	1.0	25.58	7.37	1.941	0.10	0.98	-337.7	0.41	1.261	"	
1020	1.2	25.54	7.38	1.938	0.10	0.98	-336.9	0.40	1.259	"	
1024	1.6	25.57	7.39	1.933	0.08	0.98	-323.8	0.38	1.256	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0007-038.5-20120719
 Sample ID: _____ Time Collected: 1024 Comments: ✓ Vol 4 in BLS.
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.37 gal
47 0.25

Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 1240 Date: 7/19/12 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Growpump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Solinst

Time @ Start of Purging: 1051 Time @ End of Purging: 1106 Total Purging Time: 15 min. Depth of Pump or Intake Tubing: 052.0 ft. (BTOC)

Water Level: 7.96 A. BTOC Total Well Depth: 57 A. BLS Reference: - Well diameter: 6 in. Volume in well: 84 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen: 47-57 A. BLS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1051	Start	25.74	7.72	2.522	0.22	1.30	-287.1	0.68	1.640	clear	
1101	1.0	25.79	7.54	2.518	0.12	1.29	-308.7	0.32	1.636	"	
1103	1.2	25.71	7.54	2.517	0.11	1.29	-304.2	0.31	1.636	"	
1106	1.5	25.88	7.51	2.509	0.09	1.29	-306.1	0.32	1.630	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34-RW0008-052.0-20120719 Time Collected: 1106 Comments: VOC & HBA

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= gal

When using 1/4-in. ID tubing EV=(0.0026x tubing length)+(flow thru vol.)= 0.41 gal
62 0.25

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: F005723

Field Personnel: J. Bartlett

Water Quality Meter - Model/Serial #: YSI 556MPS / 113101200

Turbidimeter - Model/Serial #: HACI+ 210002 / 110201007557

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail	
Acceptance Criteria: +/- 0.3mg/L									
CAL	CV	CCV	8/16/12	0914	22.79	8.611	4.33/8.61	108.3/100.0	P F
CAL	CV	CCV	"	1457	26.00	8.114	8.39	103.3	P F
CAL	CV	CCV							P F
CAL	CV	CCV							P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail	
Acceptance Criteria: +/- 5%									
CAL	CV	CCV	8/16/12	0941	1.413	1071147	07-2012	1.425/1.413	P F
CAL	CV	CCV	"	1518	"	"	"	1.407	P F
CAL	CV	CCV							P F
CAL	CV	CCV							P F
CAL	CV	CCV							P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail	
Acceptance Criteria: +/- 0.2 SU									
CAL	CV	CCV	8/16/12	0919	4.0	0110969	11-2012	3.91/4.00	P F
CAL	CV	CCV			7.0	1081860	09-2013	6.86/7.00	P F
CAL	CV	CCV			10.0	0122799	12-2012	10.10/10.02	P F
CAL	CV	CCV	8/16/12	1508	"	"	"	4.09	P F
CAL	CV	CCV			"	"	"	6.85	P F
CAL	CV	CCV			"	"	"	9.81	P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail	
Geosyntec Acceptance Criteria: +/- 5%									
CAL	CV	CCV	8/16/12	0945	240@25	2981	01-2016	240.4/240.0	P F
CAL	CV	CCV	"	1521	"	"	"	237.5	P F
CAL	CV	CCV							P F
CAL	CV	CCV							P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail	
Acceptance Criteria: +/- 10%					
CAL	CV	CCV	8/16/12	9.39	P F
CAL	CV	CCV	"	9.47	P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail	
Acceptance Criteria: +/- 8%					
CAL	CV	CCV	8/16/12	19.8	P F
CAL	CV	CCV	"	21.2	P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail	
Acceptance Criteria: +/- 6.5%					
CAL	CV	CCV	8/16/12	101	P F
CAL	CV	CCV	"	103	P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail	
Acceptance Criteria: +/- 5%					
CAL	CV	CCV	8/16/12	790	P F
CAL	CV	CCV	"	772	P F
CAL	CV	CCV			P F
CAL	CV	CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

- CAL - Initial Calibration
- ICV - Initial Calibration Verification
- CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: _____



Monitoring Well Sampling

Site: L034 Project No.: FO 0552B Task: 1240 Date: 8/16/12 Sampled By: J. Bartlett

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: ~0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1250 Time @ End of Purging: 1305 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 038.5 ft. (BTOC)

Water Level: 10.07 ft BTOC Total Well Depth: 42 A.BCS Reference: - Well diameter: 1.469 in. Volume in well: 61.7 gal
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Simon - 35-42 A.BCS

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1250	Start	26.29	7.37	2.596	0.97	1.34	-259.9	0.36	1.709	clear	
1300	1.0	26.19	7.37	2.762	1.82	1.43	-301.3	0.10	1.796	"	
1302	1.2	26.18	7.39	2.793	1.52	1.45	-311.0	0.10	1.825	"	
1305	1.5	26.19	7.42	2.813	1.17	1.45	-323.6	0.09	1.827	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: L034-RW0007-038.5-20120816 Time Collected: 1305 Comments: VOC & nBA

When using 3/16-in. ID tubing $EV = ((0.041)(0.035 \times \text{tubing length})) + (\text{flow thru vol.}) = \text{— gal}$

When using 1/4-in. ID tubing $EV = (0.0026 \times \text{tubing length}) + (\text{flow thru vol.}) = \text{0.37 gal}$

47 0.25

Monitoring Well Sampling

Site: LC34 Project No.: F00552B Task: 1240 Date: 8/16/12 Sampled By: J. Bartlett

Station (Well ID): RW0008 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 40.1 gpm Water Quality Meter (Make & Model): YSI 556 MPS Water Level Meter: Durham

Time @ Start of Purging: 1327 Time @ End of Purging: 1332 Total Purging Time: 15 min Depth of Pump or Intake Tubing: 652.0 ft. (BTOC)

Water Level: 9.04 ft. BTOC Total Well Depth: 57 ft. BLS Reference: - Well diameter: 6 in. Volume in well: 83.7 gal
 Screen: 47-57 ft. BLS

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1317	Start	26.53	7.93	3.639	3.99	1.91	-291.6	0.40	2.363	clear	
1327	1.0	25.79	7.70	3.633	1.88	1.91	-339.2	0.35	2.362	"	
1329	1.2	25.72	7.67	3.636	1.59	1.91	-340.1	0.34	2.363	"	
1332	1.5	25.70	7.64	3.640	1.62	1.91	-341.2	0.36	2.365	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-RW0008-052.0-20120816
 Sample ID: _____ Time Collected: 1332 Comments: VOC by nBA
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.41 gal
62 0.25

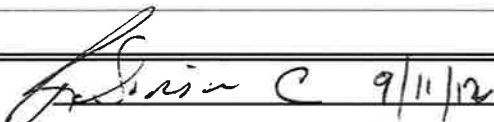
Project: <u>F00552B LC34</u>	Date: <u>9-11-12</u>
Project No.: <u>F00552B</u>	Task No.: <u>38 1821</u>
Contractors: _____	

USA 556 MFS OSD 237341C

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: _____	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: <u>BW0002 A, B, C, D, E, F</u>	Sampling Hazardous Waste: _____
Other: <u>BW0003 A, B</u>	Sampling Drums: _____
_____	_____
_____	_____

Observations/Issues of Concern
<u>06:30 arrive @ office calibrate equipment</u>
<u>08:00 arrive on site</u>
<u>sampled wells BW0002 A, B, C, D, E, F BW0003 A, B</u>
<u>Returned to office with samples + equipment 14:30</u>
<u>and calibrated equipment.</u>
<u>stored equipment completed Paper work. 15:00</u>

Plans/Future Activities

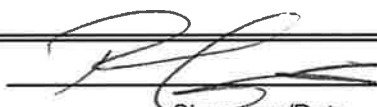

 Signature/Date

Project: <u>LC31</u> Project No.: <u>FO052B</u> Contractors: _____	Date: <u>9/13/12</u> Task No.: <u>180-1</u>
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Work Performed	
Well Installation: _____ Soil Borings: _____ DPT: _____ Well Inventory: _____ Other: _____	Sampling Soil: _____ Sampling SW/Sediment: _____ Sampling Monitor Wells: _____ Sampling Hazardous Waste: _____ Sampling Drums: _____

Observations/Issues of Concern
<p>630 AT office, Calibrating YSI, Hach 2000p.</p> <p>710 Depart for site.</p> <p>745 Arrive site & set up & Begin GW Sampling.</p> <p>1155 GW Sampling Complete, Dispose of IDW in blue Poly Drum Located Inside GW Treatment Compound. Drum is ~40% full.</p> <p>1230 Depart site for office.</p>

Plans/Future Activities


9/13/12

 Signature/Date

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC43

Project #: F00552B

Field Personnel: Robinson C

Water Quality Meter - Model/Serial #: VSI 556 MPS 05D2373411

Turbidimeter - Model/Serial #: HACH 10/10C006591

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		9-11-12	06:55	21.7	8.794	7.71/8.79	87.5/100.2	P F
CAL ICV CCV		9-11-12	14:30	24.5		7.425	8	P F
CAL ICV CCV						7.270	89.4	P F
CAL ICV CCV						8.09		P F

0.1 - 10 NTU	Std 20 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%				
CAL ICV CCV		9-11-12	20.1/20	P F
CAL ICV CCV		"	120	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		9-11-12	06:55	1.413	9373	12/12	0.997/1.413	P F
CAL ICV CCV		9-11-12	14:30	"	"	11/200	1.425	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%				
CAL ICV CCV		9-11-12	10.3	P F
CAL ICV CCV		9-11-12	8.89	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		9-11-12	06:55	7	1081860	8/13	7.61/7.00	P F
CAL ICV CCV		9-11-12		4	0110969	10/12	4.37/3.97	P F
CAL ICV CCV				10	0122799	12/12	8.65/9.66	P F
CAL ICV CCV		9-11-12	14:30	7			6.25	P F
CAL ICV CCV				4			3.94	P F
CAL ICV CCV				10			9.90	P F

41 - 100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%				
CAL ICV CCV		9-11-12	97.7/100	P F
CAL ICV CCV		"	100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		9-11-12	06:55	240	3159	3-16	237.9/240.1	P F
CAL ICV CCV		9-11-12	14:30	"	"	"	221.31	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%				
CAL ICV CCV		9-11-12	770/800	P F
CAL ICV CCV		"	1800	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
 CAL - Initial Calibration
 ICV - Initial Calibration Verification
 CCV - Continuing Calibration Verification
 Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
 Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
 Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
 If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: Failed DO, pH 7 & pH 4 CCV



Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: F005523

Field Personnel: R. Johnson

Water Quality Meter - Model/Serial #: YSI 556 MPS OSD2373A1K

Turbidimeter - Model/Serial #: HACH 1122664

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
CAL ICV CCV		9-12-12	14:45	22.4	8.677	8.22/8.67	94.7/100.0	P F
CAL ICV CCV		9-12-12	R/C	24.3	8.371	8.00		P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Std	Date	Reading (NTU)	Pass or Fail
		9-13-12	9.69	P F
CAL ICV CCV		9-13-12	10.4	P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
CAL ICV CCV		9-12-12	14:45	1.413	9373	12-12	1.413/1.413	P F
CAL ICV CCV		9-13-12	14:06	1.445	"	"	1.425	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Std	Date	Reading (NTU)	Pass or Fail
		9-13-12	19.8/20	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
CAL ICV CCV		9-12-12	14:45	7	1081860	8-13	7.05/7.00	P F
CAL ICV CCV				4	0110969	11-12	3.99/4.00	P F
CAL ICV CCV				10	0122799	12-12	9.93/9.99	P F
CAL ICV CCV		9-13-12	14:06	4	"	"	6.99	P F
CAL ICV CCV				4	"	"	3.68	P F
CAL ICV CCV				10	"	"	9.63	P F

41 - 100 NTU	Std	Date	Reading (NTU)	Pass or Fail
		9-13-12	103/100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
CAL ICV CCV		9-12-12	14:45	210	3159	3-12	240.4/240	P F
CAL ICV CCV		9-13-12	14:06	"	"	"	235.4	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Std	Date	Reading (NTU)	Pass or Fail
		9-13-12	822/100	P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F
CAL ICV CCV				P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter falls to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: fail pH 4, 10 CCV.
Pass DO CCV

Geosyntec Consultants
Water Quality Instrument Calibration Form

Project/Site: LC34

Project #: F005523 Field Personnel: P. Sizemore

Water Quality Meter - Model/Serial #: YSE 556 0455531

Turbidimeter - Model/Serial #: Hatch 2000

Dissolved Oxygen	DEP SOP FT 1500	Date	Time	Temp (°C)	Saturation (mg/L) ¹	Reading (mg/L)	Reading (%)	Pass or Fail
Acceptance Criteria: +/- 0.3mg/L								
CAL ICV CCV		9/13/12	630	23.05	8.562	9.01=8.57	100.1	P F
CAL ICV CCV		9/13/12	1519	23.41	8.51	8.50	100.0	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

0.1 - 10 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 10%			
CAL ICV CCV	9/13	10.3-10.0	P F
CAL ICV CCV	9/13	10.1	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance	DEP SOP FT 1200	Date	Time	Standard (mS/cm)	Standard Lot #	Standard Exp. Date	Reading (mS/cm)	Pass or Fail
Acceptance Criteria: +/- 5%								
CAL ICV CCV		9/13/12	632	1.413	5710	5113	1.291-1.414	P F
CAL ICV CCV		9/13/12	1520	"	"	"	1.420	P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F
CAL ICV CCV								P F

11 - 40 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 8%			
CAL ICV CCV	9/13	20.3-20.0	P F
CAL ICV CCV	9/13	20.3	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

pH	DEP SOP FT 1100	Date	Time	Standard (SU)	Standard Lot #	Standard Exp. Date	Reading (SU)	Pass or Fail
Acceptance Criteria: +/- 0.2 SU								
CAL ICV CCV		9/13/12	635	4	2203237	2119	4.09-4.02	P F
CAL ICV CCV			633	7	2111265	4/18	7.12-7.01	P F
CAL ICV CCV			636	10	2204976	4/19	10.03-10.00	P F
CAL ICV CCV		9/13/12	1521	4			4.12	P F
CAL ICV CCV			1521	7			7.22	P F
CAL ICV CCV			1522	10			10.19	P F

41 - 100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 6.5%			
CAL ICV CCV	9/13	92.5-100.0	P F
CAL ICV CCV	9/13	95.8	P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F
CAL ICV CCV			P F

ORP	SOP N/A	Date	Time	Std. mV @ Temp °C	Standard Lot #	Standard Exp. Date	Reading (mV)	Pass or Fail
Geosyntec Acceptance Criteria: +/- 5%								
CAL ICV CCV		9/13/12	638	240.25	2981	1110	240.0	P F
CAL ICV CCV		9/13/12	1529	S A M R		1110	238.9	P F
CAL ICV CCV								P F
CAL ICV CCV								P F

>100 NTU	Date	Reading (NTU)	Pass or Fail
Acceptance Criteria: +/- 5%			
CAL ICV CCV	9/13	197-800	P F
CAL ICV CCV	9/13	78.9	P F
CAL ICV CCV			P F
CAL ICV CCV			P F

Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form
CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Comments: Farked pH7 CCV

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier



Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 1B #1 Date: 9/13/12 Sampled By: D. Szemoch

Station (Well ID): RW0007 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model): YSE 556 Water Level Meter: Durham

Time @ Start of Purging: 930 Time @ End of Purging: 951 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)

Water Level: 5.90 Total Well Depth: 42 Reference: BTOC Well diameter: 6 in. Volume in well: NA

35-42

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
937	.5 Start	26.42	7.94	.915	7.5	.45	-243.2	.58	.60	Clear	—
944	1.0	26.46	7.84	.919	3.4	.45	-240.0	.29	.60	"	—
951	1.5	26.50	7.85	.919	2.9	.45	-241.0	.25	.60	"	—

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - RW0007 - 037.5 - 20/20413 Time Collected: 951 Comments: VOCs, MRE, TOC, PHC ~~Failed pH 7 CCV~~

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using ¼-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 4 gal

40 .3

J' qualified

Monitoring Well Sampling

Site: LC34 Project No.: FO05528 Task: 1841 Date: 9/13/12 Sampled By: D. Siremore

Station (Well ID): IW0002I Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Gro pump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 803 Time @ End of Purging: 824 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC) 27.5

Water Level: 4.78 Total Well Depth: 55.30 Reference: BTOC Well diameter: 2 in. Volume in well: N/A
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
screen 50-55
25.30

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
810 810	Start .5	26.39	7.68	.501	11.8	.24	+16.2	.94	.34	Clear	—
817	1.0	26.30	7.62	.504	11.3	.25	+17.3	.91	.35	"	—
824	1.5	26.36	7.63	.509	10.9	.25	+17.7	.77	.33	"	—

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - IW0002I - 027.5 - 2012 09 13
 Sample ID: _____ Time Collected: 824 Comments: VOC, MER, TOC
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.4 gal
30 .3
5' qualified
Ph 7 CCV

Monitoring Well Sampling

Site: LC34 Project No.: F0052B Task: 18*1 Date: 9/13/12 Sampled By: D. Sreemore

Station (Well ID): IW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 1.07 gpm Water Quality Meter (Make & Model) YSF 556 Water Level Meter: Durham

Time @ Start of Purging: 830 Time @ End of Purging: 851 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 37.5 ft. (BTOC)

Water Level: 4.91 Total Well Depth: 40 Reference: BTOC Well diameter: 2 in. Volume in well: NA
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
837	Start: .5	26.01	7.79	.711	6.8	.35	-125.7	.56	.46	Clear	---
844	1.0	26.00	7.76	.715 .715	5.8	.37	-152.8	.44	.50	"	---
851	1.5	26.06	7.76	.716	6.6	.37	-156.6	.56	.50	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: LC34 - IW0002D - 037.5 - 20120913 Time Collected: 851 Comments: VOC, TOC, metals skipped pH & CCV

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 1.7 gal
40 .3 5' qualified

Monitoring Well Sampling

Site: LC34 Project No.: F00502 B Task: 38184 Date: 9-13-12 Sampled By: Redman c

Station (Well ID): BW0001A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model): 485586 Water Level Meter: Hecan

Time @ Start of Purging: 10:30 Time @ End of Purging: 10:53 Total Purging Time: 21 Depth of Pump or Intake Tubing: 224.5 ft. (BTOC)

Water Level: 4.9 Total Well Depth: 26 Reference: BTOC Well diameter: 3/4 in. Volume in well:

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
10:30	Start	26.10	7.41	.905	9.14	.44	-173.8	2.16	.586	Clear	—
10:37	.5	26.21	7.39	.896	3.23	.44	-152.9	1.83	.582	"	"
10:45	1.0	26.20	7.41	.893	1.44	.44	-141.9	1.45	.580	"	"
10:53	1.5	26.19	7.41	.893	.50	.44	-141.0	1.36	.581	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 - BW0001A - 224.5 - 20120913
 Sample ID: Time Collected: 10:53 Comments: Voc, PEE, TOC 3rd Farado, Ph 4, Ph 7 CCV

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = 0.4 gal

026 x 022.5 + .3 =

5 qualified

Monitoring Well Sampling

Site: LC 34 Project No.: FOO55213 Task: 88187 Date: 9.13.12 Sampled By: Robinson C

Station (Well ID): BW000113 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (___ Teflon ___ SS ___ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): GEO Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 552 Water Level Meter: Hikon

Time @ Start of Purging: 11:00 Time @ End of Purging: 11:21 Total Purging Time: 21 Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 6 Total Well Depth: 33 Reference: BTOC Well diameter: 3/4 in. Volume in well: _____

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
11:00	Start	26.56	7.56	0.930	3.39	0.46	-155.1	0.99	0.615	CLEAR	—
11:07	0.5	26.43	7.57	1.014	1.74	0.50	-161.1	1.01	0.665	"	✓
11:14	1.0	26.36	7.59	1.046	0.74	0.52	-162.5	1.12	0.684	"	✓
11:21	1.5	26.34	7.59	1.058	0.60	0.52	-164.4	1.21	0.690	"	✓

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC 34 · BW000113 · 031.5 · 20120913
 Sample ID: _____ Time Collected: 11:23 Comments: NOE. MEE. TOC FAIRTA PH 4 & PH 10 CLV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.4 gal
 .0026 X 33 + .32
5' qualified DO,

Monitoring Well Sampling

Site: LC34 Project No.: F00552B Task: 18*1 Date: 9/13/12 Sampled By: O. Sice mora

Station (Well ID): BW0001C Purge Method: Pump Bailer _____ Pump Type: ___ Submersible (___ Teflon ___ SS ___ Other) Peristaltic ___ Centrifugal ___ Bladder

Pump (Make & Model): Goopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YS5556 Water Level Meter: Purham

Time @ Start of Purging: 1106 Time @ End of Purging: 1127 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.25 Total Well Depth: 40 Reference: BTOC Well diameter: 3/4 in. Volume in well: N/A
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)
Screen 37-40

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1113	Start .5	26.46	7.61	.984	5.3	.48	-16.5	.41	.64	Clear	
1120	1.0	26.49	7.61	.985	5.3	.48	-16.0	.42	.65	"	
1127	1.5	26.42	7.61	.985	5.6	.48	-16.0	.41	.65	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every ¼ well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001C-038.5-20120913
 Sample ID: _____ Time Collected: 1127 Comments: VOC, TOC, MET, DHC ^{SB} Faded pH TCCV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using ¼-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .9 gal
39 .3
J qualified

Monitoring Well Sampling

Site: LC 34 Project No.: F005508 Task: BW 38 Date: 9-13-12 Sampled By: Ros. Jordan

Station (Well ID): BW001D Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: H2RO

Time @ Start of Purging: 11:50 Time @ End of Purging: 12:11 Total Purging Time: 21 Depth of Pump or Intake Tubing: 45.5 ft. (BTOC)

Water Level: 9 Total Well Depth: 47 Reference: BTOC Well diameter: 3/4 in. Volume in well: _____
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
11:50	Start	26.75	6.93	3.654	7.1	1.92	-269.4	1.25	2.400	Cloudy	11
11:57	0.5	26.89	6.92	3.770	33.4	1.99	-279.6	1.61	2.545	"	11
12:04	1.0	25.91	6.95	3.777	23.4	1.99	-277.5	1.77	2.456	"	11
12:11	1.5	25.72	6.99	3.786	17.3	1.99	-283.3	1.62	2.462	"	11

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC 34 BW001D · 045.5 · 20120913
 Sample ID: _____ Time Collected: 12:13 Comments: DOC · MEE · TOC SB Fertil Ph 4, Ph 10 CCl
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.4 gal
0026 x 045.5 + .3 =

J qualified DO,

Monitoring Well Sampling

Site: LC 34 Project No.: FO 0552 B Task: 38^{JB} 18⁴ Date: 9-11-12 Sampled By: Robinson C

Station (Well ID): BW0002A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): GEO Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: HERON

Time @ Start of Purging: 0845 Time @ End of Purging: 0906 Total Purging Time: 21 Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.17 BTOC Total Well Depth: 26 Reference: BTOC Well diameter: 3/4 in. Volume in well:

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
08:45	Start	26.37	7.23	.976	2.30	.48	53.4	1.24	.634	Clear	None
08:52	0.5	26.35	7.17	.968	.95	.48	43.7	.82	.630	Clear	"
08:59	1.0	26.22	7.14	.964	1.08	.47	36.0	.71	.626	"	"
09:06	1.5	26.18	7.13	.962	.56	.47	22.2	.70	.625	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC 34 - BW0002A - 024.5 - 20120911

Sample ID: Time Collected: 09:07 Comments: Voc, Merc, Toc, Farther¹⁰⁵ Ph 4, Ph 7 & DO CCLV

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = .37 gal

.0026 * 26 + .3 = .37

J qualified

Monitoring Well Sampling

Site: LC34 Project No.: F0052 B Task: ~~38~~ 18⁰¹ Date: 9-11-12 Sampled By: R. S. Isaac

Station (Well ID): BW0002B Purge Method: Pump Bailer Pump Type: Submersible (SS Other) X Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556MB Water Level Meter: Heron

Time @ Start of Purging: 09:22 Time @ End of Purging: 09:43 Total Purging Time: 28 Depth of Pump or Intake Tubing: 31.5 ft. (BTOC)

Water Level: 5.8.5 Total Well Depth: 33 Reference: BFOC Well diameter: 3/4 in. Volume in well: —

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
09:22	Start	26.32	7.21	.956	12.6	.47	2.5	2.05	.621	Cloudy	—
09:29	.5	26.18	7.17	.957	7.64	.47	-5.1	.46	.622	"	"
09:36	1.0	25.98	7.21	.950	2.41	.47	-12.9	.40	.616	"	"
09:43	1.5	26.0	7.23	.945	1.06	.46	-19.6	.30	.614	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002B-031.5-20120911

Sample ID: _____ Time Collected: 09:45 Comments: VOC, MEE, TOC, ~~PH~~ PH4, PH7 & DO CLV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .38 gal

.0026 x 33 + .3 = .38

Monitoring Well Sampling

Site: LC 34 Project No.: FOO 552 B Task: 38^{ITS} 18⁺ Date: 9-11-12 Sampled By: Rosinson C

Station (Well ID): BW0002 C Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) 1 Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MP Water Level Meter: Heron

Time @ Start of Purging: 09:50 Time @ End of Purging: 10:11 Total Purging Time: 21 Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.4 Total Well Depth: 40 Reference: BTOC Well diameter: 3/4 in. Volume in well: —

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
09:50	Start	25.91	7.05	2.501	4.42	1.28	-74.3	.28	1.625	CLEAR	—
09:57	.5	25.85	7.25	2.465	2.06	1.27	-157.8	.23	1.602	"	"
10:04	1.0	25.80	7.37	2.468	1.62	1.27	-224.7	.29	1.607	"	"
10:11	1.5	25.8.9	7.44	2.491	.94	1.28	-250.2	.30	1.621	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002C-038.5-20120911

Sample ID: _____ Time Collected: 10:13 Comments: Voc, Meq, TBC, JBC, Failed Ph 4, Ph 7 & DOCCV

When using 3/16-in. ID tubing EV= ((0.041)(0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .40 gal

.0026 X 40 + .3 = .40

J qualified

Monitoring Well Sampling

Site: LC34 Project No.: F0055 2B Task: 38 10* Date: 9.11.12 Sampled By: Redison C

Station (Well ID): BW0002D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MP Water Level Meter: Heron

Time @ Start of Purging: 11:30 Time @ End of Purging: 11:51 Total Purging Time: 21 Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 6.4 Total Well Depth: 410 Reference: BTOC Well diameter: 3/4 in. Volume in well: -

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
11:30	Start	26.96	7.73	3.264	20.9	1.70	-232.8	3.29	2.121	cloudy	-
11:37	.5	26.87	7.71	3.295	16.9	1.72	-305.0	2.21	2.141	"	"
11:44	1.0	26.85	7.69	3.304	8.22	1.72	-320.8	1.87	2.150	"	"
11:51	1.5	26.90	7.69	3.311	5.52	1.73	-324.6	1.77	2.155	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate

Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002D - 045.5 - 20120911

Sample ID: _____ Time Collected: 11:53 Comments: VOC, MCA, TOC, FA, Ph 4, Ph 7 & DO CV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= ~ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .42 gal

$.0026 \times 47 + .3 = .42$

J qualified

Monitoring Well Sampling

Site: LC 34 Project No.: FO05523 Task: 3E 18th Date: 9-11-12 Sampled By: R. Sidor

Station (Well ID): BW0003A Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556-M1 Water Level Meter: Heon

Time @ Start of Purging: 12:53 Time @ End of Purging: 13:14 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 024.5 ft. (BTOC)

Water Level: 5.1 Total Well Depth: 26 Reference: BTOC Well diameter: 3/4 in. Volume in well: —
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
12:53	Start	26.39	7.93	.988	4.59	.45	-94.2	3.65	.599	CLEAR	—
13:00	.5	26.52	7.52	.913	1.49	.45	-88.3	2.62	.591	CLEAR	—
13:07	1.0	26.59	7.42	.901	.63	.44	-86.8	2.39	.585	"	"
13:14	1.5	26.60	7.41	.898	.40	.44	-87.1	2.32	.583	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003A-024.5-20120911
 Sample ID: _____ Time Collected: 13:18 Comments: VOC, MEE, TOC Failed Ph 4, Ph 7 & DO CCV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= — gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .37 gal
 .0026 x 26 + .3 = .37
J qualified

Monitoring Well Sampling

Site: LC34 Project No.: F0052B Task: 38^{JB} 10^{*} Date: 9-11-12 Sampled By: Robinson

Station (Well ID): BW0003B Purge Method: Pump Bailer Pump Type: Peristaltic Submersible (Teflon SS Other) Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YS2556 MP Water Level Meter: HELO

Time @ Start of Purging: 13:21 Time @ End of Purging: 13:42 Total Purging Time: 21 Depth of Pump or Intake Tubing: 031.5 ft. (BTOC)

Water Level: 6.45 Total Well Depth: 33 Reference: BTOC Well diameter: 3/4 in. Volume in well: —
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
13:21	Start	26.13	7.34	.897	3.96	.44	-101.1	1.71	.582	CLEAR	—
13:28	.5	26.00	7.32	.894	2.11	.44	-102.8	1.60	.581	"	"
13:35	1.0	25.91	7.30	.896	.77	.44	-104.0	1.53	.578	"	"
13:42	1.5	26.01	7.28	.888	.62	.43	-104.1	1.49	.577	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003B-031.5-20120911
 Sample ID: _____ Time Collected: 13:45 Comments: Vol, MFE, TOC Failed pH 4.7 & DO CV
 When using 3/16-in. ID tubing EV = ((0.041)(0.035x tubing length)) + (flow thru vol.) = — gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = .38 gal
31.5 .0026 x 33 + .3 = .38
J qualified

Monitoring Well Sampling

Site: KC34 Project No.: F0055213 Task: 2018³⁵ Date: 9-13-12 Sampled By: Robinson C

Station (Well ID): BW0003C Purge Method: Pump Bailer Pump Type: Submersible (SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron

Time @ Start of Purging: 08:12 Time @ End of Purging: 08:33 Total Purging Time: 21 Depth of Pump or Intake Tubing: 38.5 ft. (BTOC)

Water Level: 5.15 Total Well Depth: 40 Reference: BTOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
08:12	Start	25.71	7.53	1.169	6.70	.58	-119.2	4.38	.759	CLEAR	-
08:19	.5	25.66	7.60	1.143	3.27	.56	-135.6	7.43	.742	"	"
08:26	1.0	25.61	7.62	1.144	1.92	.57	-138.1	3.36	.745	"	"
08:33	1.5	25.55	7.65	1.160	1.64	.58	-140.9	3.09	.757	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

Sample ID: KC34-BW0003C 0.38.5 20120913 Time Collected: 08:35 Comments: NOE, MEE, TOE Failed PH4 & PH10 CCV

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026xtubing length) + (flow thru vol.) = 0.4 gal

.0026x 40 + .3 =

J qualified DO,

Monitoring Well Sampling

Site: LC34 Project No.: F00552B Task: 25 10*1 Date: 9.13.12 Sampled By: Robinson C

Station (Well ID): BW0003D Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: HECON

Time @ Start of Purging: 09:45 Time @ End of Purging: 10:06 Total Purging Time: 21 Depth of Pump or Intake Tubing: 045.5 ft. (BTOC)

Water Level: 10 Total Well Depth: 47 Reference: BTOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
09:45	Start	25.76	7.11	3.113	3.60	1.62	-284.2	1.66	2.023	cloudy	-
09:52	.5	25.80	7.23	3.123	2.60	1.62	-275.8	1.82	2.031	"	4
09:59	1.0	25.76	7.24	3.127	1.52	1.63	-274.2	1.48	2.033	"	7
10:06	1.5	25.75	7.28	3.129	1.34	1.63	-267.9	1.35	2.034	"	4

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003D - 045.5 - 20120913
 Sample ID: _____ Time Collected: 10:08 Comments: NOV. MSE. TOC Failed Ph 4 & Ph 10 UV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal 5 qualified
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.4 gal
 .0026 X 045.5 + .9 =

Monitoring Well Sampling

Site: LC34 Project No.: FO 0552B Task: 18*1 Date: 9/13/12 Sampled By: D. Sizemore

Station (Well ID): RW0008 Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Deepump Purge Rate: .07 gpm Water Quality Meter (Make & Model) VSI 556 Water Level Meter: Durham

Time @ Start of Purging: 959 Time @ End of Purging: 1020 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 52 ft. (BTOC)

Water Level: 4.98 Total Well Depth: 57 Reference: BTOC Well diameter: 6 in. Volume in well: N/A

Screen 47-57

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
<u>1006</u>	<u>Start .5</u>	<u>26.65</u>	<u>7.80</u>	<u>2.547</u>	<u>5.5</u>	<u>1.31</u>	<u>-246.7</u>	<u>.51</u>	<u>1.65</u>	<u>Clear</u>	<u>—</u>
<u>1013</u>	<u>1.0</u>	<u>26.70</u>	<u>7.79</u>	<u>2.551</u>	<u>4.4</u>	<u>1.31</u>	<u>-247.9</u>	<u>.35</u>	<u>1.66</u>	<u>"</u>	<u>—</u>
<u>1020</u>	<u>1.5</u>	<u>26.65</u>	<u>7.77</u>	<u>2.555</u>	<u>5.2</u>	<u>1.32</u>	<u>-242.0</u>	<u>.40</u>	<u>1.67</u>	<u>"</u>	<u>—</u>

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC 34 - RW0008 - 052-0 - 20120913

Sample ID: _____ Time Collected: 1020 Comments: VOL, TOL, MEE, DHC, Failed Ph 7 CCV

When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = gal

When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = gal

1955 .3

5 qualified

Monitoring Well Sampling

Site: LC34 Project No.: F00552B Task: 18*1 Date: 9/13/12 Sampled By: D. Sizemore

Station (Well ID): IW0002DI Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder
 Pump (Make & Model): Geopump Purge Rate: 1.07 gpm Water Quality Meter (Make & Model): YSI 556 Water Level Meter: Durham
 Time @ Start of Purging: 901 Time @ End of Purging: 922 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)
 Water Level: 5.00 Total Well Depth: 55 Reference: BTOC Well diameter: 2 in. Volume in well: NA
screen 50-55 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
908	Start	26.11	7.76	2.334	2.6	1.20	-272.2	.21	1.52	Clear	—
915	1.0	26.03	7.77	2.338	2.9	1.22	-273.2	.24	1.55	"	—
922	1.5	25.99	7.77	2.339	2.9	1.25	-275.8	.23	1.59	"	—

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.
 Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.
 Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs
 If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater
 For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-IW0002DI-20120913
 Sample ID: _____ Time Collected: 922 Comments: VOC, TOC, MRE SP Failed CCV (pH)
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 4 gal
53 3 5 3
5 qualified

Monitoring Well Sampling

Site: LC 34 Project No.: F0055218 Task: 538181 Date: 9.13.12 Sampled By: Resinson C

Station (Well ID): DW001E Purge Method: Pump Bailer _____ Pump Type: _____ Submersible (____ Teflon ____ SS ____ Other) A Peristaltic _____ Centrifugal _____ Bladder _____

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: H560-

Time @ Start of Purging: 11:30 Time @ End of Purging: 11:51 Total Purging Time: 21 Depth of Pump or Intake Tubing: 052.5 ft. (BTOC)

Water Level: 5.95 Total Well Depth: 54 Reference: B TOC Well diameter: 3/4 in. Volume in well: _____

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
11:30	Start	26.33	7.54	3.319	30.0	1.73	-279.6	2.12	2.157	cloudy	-
11:37	0.5	26.23	7.54	3.324	23.9	1.73	-279.3	1.68	2.161	"	"
11:44	1.0	26.23	7.53	3.331	15.3	1.74	-275.9	1.50	2.167	"	"
11:51	1.5	26.24	7.54	3.340	7.10	1.74	-273.6	1.43	2.174	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 · DW001E · 052.5 · 20120913

Sample ID: _____ Time Collected: 11:53 Comments: VOE. MEE. TOC OR Failed Ph4 & Ph10 CCV

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal

When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.4 gal

• 0026K 54 + .3 =

J qualified DO,

Monitoring Well Sampling

Site: LC34 Project No.: FO052B Task: 18*1 Date: 9/13/12 Sampled By: D. Sremore

Station (Well ID): BW0001F Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model): YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 1130 Time @ End of Purging: 1151 Total Purging Time: 21 min Depth of Pump or Intake Tubing: 59.5 ft. (BTOC)

Water Level: 5.00 Total Well Depth: 61 Reference: BTOC Well diameter: 3/4 in. Volume in well: PA

58-61

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1137	Start, 5	26.25	7.14	2.519	10.7	1.30	-165.2	.76	1.45	Clear	—
1144	1.0	26.18	7.16	2.519	6.9	1.31	-166.3	.50	1.65	21	—
1151	1.5	26.19	7.15	2.520	6.6	1.29	-175.0	.47	1.65	21	—

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0001F-059-5-10120913
 Sample ID: _____ Time Collected: 1151 Comments: VOC, TOC, NFE JS Factored PH TCCV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= 2 gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 4 gal
60 3

J qualified

Monitoring Well Sampling

Site: LC 34 Project No.: F00552B Task: 3818^{5B} Date: 9-11-12 Sampled By: Robinson C

Station (Well ID): BW 0002E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other Peristaltic Centrifugal Bladder)

Pump (Make & Model): Geo Pump Purge Rate: _____ gpm Water Quality Meter (Make & Model) YSI 556 M1 Water Level Meter: H&K

Time @ Start of Purging: 10:59 Time @ End of Purging: 11:20 Total Purging Time: 21 Depth of Pump or Intake Tubing: 52.5 ft. (BTOC)

Water Level: 6.0 Total Well Depth: 54 Reference: BTOC Well diameter: 3/4 in. Volume in well: _____

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
10:59	Start	25.80	7.77	2.760	69.3	1.43	-200.5	1.36	1.802	cloudy	—
11:06	.5	26.26	7.70	3.161	27.4	1.65	-217.9	1.46	1.994	"	"
11:13	1.0	26.22	7.73	3.200	8.87	1.67	-230.0	1.49	2.084	"	Y
11:20	1.5	26.21	7.74	3.212	2.65	1.67	-236.0	1.44	2.088	"	LI

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW 0002E- 052.5- 20120911
 Sample ID: _____ Time Collected: 11:22 Comments: Vol. M&E, Toc, Fast Focused Ph4, Ph7 & DO C/V

When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .44 gal

.0026 x 54 + .3 = .44

J qualified

Monitoring Well Sampling

Site: LC 34 Project No.: F00552B Task: 38 18th Date: 9-11-12 Sampled By: Ros:warner

Station (Well ID): BW0002F Purge Method: Pump Bailer Pump Type: Peristaltic Submersible (Teflon SS Other)

Pump (Make & Model): Geo pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 MPS Water Level Meter: Heron

Time @ Start of Purging: 10:25 Time @ End of Purging: 10:46 Total Purging Time: 21 Depth of Pump or Intake Tubing: 059.5 ~~095.5~~ ft. (BTOC)

Water Level: 5.8 Total Well Depth: 67 Reference: BTOC Well diameter: 3/4 in. Volume in well: —
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
10:25	Start	26.10	7.80	3.231	3.77	1.68	-270.0	1.02	2.105	Clear	—
10:32	.5	26.15	7.82	3.247	3.24	1.69	-280.8	.82	2.114	"	"
10:39	1.0	26.24	7.83	3.294	2.31	1.72	-287.7	.72	2.141	"	"
10:46	1.5	26.23	7.82	3.301	1.85	1.72	-285.5	.71	2.146	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0002F - 059.5 ~~095.5~~ 20120911
 Sample ID: Time Collected: 10:48 Comments: VOC . MEC . TOC ~~Failed~~ Ph4, Ph7 & DO CCV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= .42 gal
.0026 x 47 + .2 = .42
 J qualified

Monitoring Well Sampling

Site: LC34 Project No.: FOO55 2B Task: 2818*1 Date: 9.13.12 Sampled By: Rob. W.

Station (Well ID): BW0003E Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geo Pump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) 402 JSG Water Level Meter: Helon

Time @ Start of Purging: 09:15 Time @ End of Purging: 09:36 Total Purging Time: 21 Depth of Pump or Intake Tubing: 0.52.5 ft. (BTOC)

Water Level: 9 Total Well Depth: 54 Reference: B TOU Well diameter: 3/4 in. Volume in well: —

Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
09:15	Start	25.79	6.87	3.343	5.48	1.75	-232.4	2.66	2.174	cloudy	—
09:22	0.5	25.79	7.02	3.347	4.33	1.75	-234.9	2.23	2.176	"	✓
09:29	1.0	25.75	7.23	3.355	2.22	1.75	-236.5	1.93	2.181	"	✓
09:36	1.5	25.70	7.33	3.358	0.92	1.75	-238.4	1.73	2.181	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ±0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34 BW0003E - 0.52.5 - 20120913
 Sample ID: _____ Time Collected: 09:38 Comments: voc. M&E. TOC 5th Factor Ph 4 & Ph 10 CCV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= _____ gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= 0.4 gal
.0026 x 0.52.5 + 3 =
J qualified

Monitoring Well Sampling

Site: LC34 Project No.: F005525 Task: 3/8 10*1 Date: 9.13-12 Sampled By: Rebinor e

Station (Well ID): BW0003 F Purge Method: Pump Bailer Pump Type: Peristaltic Submersible (Teflon SS Other) Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: 0.1 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Heron

Time @ Start of Purging: 08:40 Time @ End of Purging: 09:08 Total Purging Time: 28 Depth of Pump or Intake Tubing: 059.5 ft. (BTOC)

Water Level: 5.55 Total Well Depth: 61 Reference: BTOC Well diameter: 3/4 in. Volume in well: NA
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
08:40	Start	25.80	6.98	2.296	26.3	1.24	-230.3	2.13	1.692	Cloudy	—
08:47	.5	25.77	7.30	3.294	18.5	1.73	-275.4	2.08	2.161	"	"
08:54	1.0	25.80	7.45	3.425	9.69	1.80	-278.6	1.82	2.234	"	"
09:01	1.5	25.79	7.50	3.447	7.52	1.80	-271.4	1.72	2.242	"	"
09:08	2.0	25.77	7.54	3.461	5.25	1.81	-261.6	1.63	2.252	"	"

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.

LC34-BW0003 F .059.5 - 2012 09 13
 Sample ID: _____ Time Collected: 09:10 Comments: vac. MEE . TOC J qualified DO, started Ph 4 & Ph 10 CCU
 When using 3/16-in. ID tubing EV = ((0.041) (0.035x tubing length)) + (flow thru vol.) = _____ gal
 When using 1/4-in. ID tubing EV = (0.0026x tubing length) + (flow thru vol.) = 0.4 gal
 .0026 x 059.5 + .3 =

Monitoring Well Sampling

Site: LC34 Project No.: F00552B Task: 18X1 Date: 9/13/12 Sampled By: D. Sizemore

Station (Well ID): Iw0076 Purge Method: Pump Bailer Pump Type: Submersible (Teflon SS Other) Peristaltic Centrifugal Bladder

Pump (Make & Model): Geopump Purge Rate: .07 gpm Water Quality Meter (Make & Model) YSI 556 Water Level Meter: Durham

Time @ Start of Purging: 1031 Time @ End of Purging: 1102 Total Purging Time: 31 min Depth of Pump or Intake Tubing: 75 ft. (BTOC)

Water Level: 5.68 Total Well Depth: 80 Reference: BTOC Well diameter: 2 in. Volume in well: NA
 Correction Factors: (3/4" use 0.02, 1" use 0.041, 2" use 0.163, 4" use 0.653, 6" use 1.469)

Time (hrs)	Cumulative Purge Volume (gal)	Temp (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	Salinity (%)	ORP (mV)	DO (mg/L)	TDS (g/L)	Color	Comments
1038	Start .5	26.33	7.68	2.537	18.7	1.30	-159.4	.70	1.65	Clear	
1045	1.0	26.23	7.81	2.536	7.5	1.32	-137.9	.58	1.67	Clear	
1102	1.5	26.26	7.80	2.536	6.9	1.32	-139.7	.49	1.67	"	

Note: When purging well with pump or intake tubing within the well screen, purge minimum of 1 equipment volume prior to first field parameter measurements. Take additional field parameter measurements no sooner than 2 to 3 minutes apart, must purge minimum of 3 equipment volume + stabilized field parameters for sampling.

Note: When purging a well with well screen fully submerged and pump or intake tubing is placed in water column above the screened zone, purge minimum of one well volume prior to collecting first field parameter measurements. Take additional field parameter measurements every 1/4 well volume until purging requirements are satisfied.

Note: Three (3) consecutive readings within specified limits are to be obtained for sampling. Temperature: ± 0.2 °C; pH: ± 0.2 standard units; Specific Conductance: ± 5.0% of reading; DO is no greater than 20% saturation at field measured temperature; and Turbidity ≤ 20 NTUs

If DO or Turbidity measurements cannot meet the above requirements within 5 well volumes; Temp, pH, Conductivity ranges remain unchanged, however, DO and turbidity must meet the following: DO ± 0.2 mg/L or 10%, whichever is greater; and Turbidity ± 5 NTUs or 10%, whichever is greater

For high turbidity and DO, check flow through cell for air bubbles, which may be causing erroneous readings. Turbidity should be verified visually and with a separate Turbidity meter (if available). All attempts should be made to get the parameters within the specified limits. Check water quality meter calibration before using again.


LC34-IW0076-075.0-20120913
 Sample ID: _____ Time Collected: 1102 Comments: Toe, MEE, Vol, Failed pH 7 CEV
 When using 3/16-in. ID tubing EV= ((0.041) (0.035x tubing length))+(flow thru vol.)= gal
 When using 1/4-in. ID tubing EV=(0.0026xtubing length)+(flow thru vol.)= < 3 gal
75 .3
 J. qualified

Project: <u>LC34</u>	Date: <u>9/10/12</u>
Project No.: <u>F00552B</u>	Task No.: <u>1841</u>
Contractors: <u>ECS</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: <u>Scan DPT 349, 350 & 351</u>	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
0724 Dms Arrives Badging Station.
0745 Drillers arrive. Drillers badging information is not in the System @ Badging Station. Contact Joe Bartlett.
830 Badging 1's Complete, move to site.
904 Archie Site & set up.
911 Dms Conducts Safety Discussion & Tailgate meeting
ECS crew includes: Mike Miller (Driller); Chris Ausburn helper.
918 Drillers set up on DPT 0349.
1207 DPT 349 Complete, Set up on DPT 350.
1308 Phase I
1315 Begin Mockcut Rain
1352 Stops Raining.
1450 Begin Phase II. All personnel take cover in vehicles.
1543 Phase 2 over, Continue DPT 350. Note: Lost Sample End Cap in DPT 350
1655 DPT 350 Complete, set up on DPT 351.

Plans/Future Activities
NOTE: Because Sampler end cap was lost in DPT 350, only one sampler available to complete DPT 351.
1745 Lost 2nd, and only remaining sampler end cap down hole. Can not continue DPTs until ^{2nd} second replaced
Will continue tomorrow AM.
1815 Clean up & Report Site


 9/10/12
 Signature/Date

Project: <u>ESTCP LC34</u>	Date: <u>9/11/12</u>
Project No.: <u>F005524</u>	Task No.: <u>18X1</u>
Contractors: <u>RDC</u>	

Work Performed	
Well Installation: _____	Sampling Soil: _____
Soil Borings: <u>SB 351</u>	Sampling SW/Sediment: _____
DPT: _____	Sampling Monitor Wells: _____
Well Inventory: _____	Sampling Hazardous Waste: _____
Other: _____	Sampling Drums: _____

Observations/Issues of Concern
630 Arrive office & prep for soil & gw sampling
CR Arrives @ 645 & Calibrates WQMs.
745 Meet Drillers @ Budeing Station, move to site
810 Arrive site. Conduct fullgate meeting w/ safety discussion.
820 Begin drilling DPT 351 40'-60'. CR Begins gw sampling
955 Drilling DPT 351 complete; Drillers begin grouting baseholes & cleaning up.
1153 Remove data logger from Trailer.
1302 Remove data logger from RW8
1323 Remove data logger from Row 7 - String Broken, had to "fish" out.

Plans/Future Activities

 9/11/12
Signature/Date

BORING LOG

BORING NO.: DPT0349-346-332 PROJECT NO.: F0052B PAGE 1 OF 1
 SITE: LC34 DATE: 9/10/12
 TOOLS AND METHOD: Macro Core DP BIT DIA: 2.3"
 TOTAL DEPTH: 60 GROUNDWATER DEPTH: ~ 5' BLS
 DRILLING COMPANY: EOS RIG: Geoprobe 6610DT
 DRILLERS: Mike Miller LOGGERS: D. Sizemore

FW 76
DPT 349
• RWB
• RW-7

LITHOLOGY LOG

GRAPHIC LOG

DEPTH SCALE

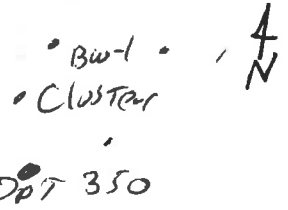
PID (ppm)

DRILLING LOG

Gray Silty fine SAND sm wl fragmented shell (5%)	Core	31	0.6	
		32	0	
		33	0	
		34	0.6	
		35	5.9	
	Core	36	11.2	
		37	5.0	-- Grab sample collected @ 1044-DPT0349-37.0
		38	9.8	
		39	20.4	
		40	6.5	-- Grab sample collected @ 1047-DPT0349-40.0
		41	3.4	
	Core	42	4.5	
		43	5.1	-- Grab sample collected @ 1103-DPT0349-43.5
		44	3.4	
Gray Sandy CLAY wl med. CL Plasticity wl some shell (1%) below 44'	Core	45	5.0	-- Grab sample collected @ 1107-DPT0349-45.0
		46	5.2	-- Grab sample collected @ 1133-DPT0349-46.5
	Core	47	*24.6	-- Grab sample collected @ 1136-DPT0349-48.0
		48	6.1	
Gray Silty fine SAND below 49' wl some frag. shell (5%) sm	Core	49	2.1	
		50	2.0	
		51	0.2	
	Core	52	0	
Same		53	0	-- Grab sample collected @ 1148-DPT0349-53.0
		54	0.2	
		55	0	
		56	0	
Same	Core	57	0	
		58	0	
		59	0	
		60	0	

For Boring term @ 60' and Abandoned w/ gravel
** Grab Sample Collected @ 1809-DPT0349-47.0*
○ = DHC sample collected

BORING LOG



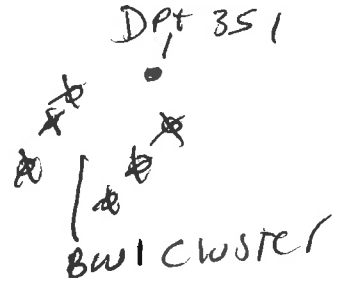
BORING NO.: DPT 0350-347-333 PROJECT NO.: F00552B PAGE 1 OF 1
 SITE: LC34 DATE: 07/10/12
 TOOLS AND METHOD: MacroCore, Direct Push BIT DIA: 2.3"
 TOTAL DEPTH: 60 GROUNDWATER DEPTH: ~5' BLS
 DRILLING COMPANY: FWS RIG: Geoprobe 6610 DT
 DRILLERS: Mike Miller LOGGERS: D. Szemore

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG
Gray fine SAND w/ Frag shell (25%), SM	Core	31	0	
		32	1.4	
		33	0.1	
		34	13.5	
		35	2.7	
		36	5.4	
		37	6.9	-- Grab Sample collected @ 1352 DPT 350-37.0
		38	7.2	
		39	6.5	
		40	7.1	-- Grab Sample collected @ 1411 - DPT 350 - 040.0
Gray CLAY w/ Fragmented shell (20%) (10%) med. plasticity below H4' CL	Core	41	6.3	
		42	7.1	
		43	5.8	-- Grab Sample collected @ 1418 - DPT 350 - 044.0
		44	4.2	
		45	5.1	-- Grab Sample collected @ 1441 - DPT 350 - 045.5
Gray silty fine SAND w/ Fragmented shell (20%) below SM 48'	Core	46	3.4	
		47	2.4	-- Grab Sample collected @ 1450 - DPT 350 - 047.0
		48	2.5	-- Grab Sample collected @ 1506 - DPT 350 - 048.5
		49	1.6	-- Grab Sample collected @ 1636
		50	2.5	-- Grab Sample collected @ 1643 DPT 350 - 053.0
SAND	Core	51	1.2	
		52	0	
		53	0.5	
		54	0.1	
		55	0	
SAND	Core	56	0	
		57	0	
		58	0	
		59	0	
		60	0	

Boring term @ 60' and abandoned w/ brot

○ DTH Sample collected

BORING LOG



BORING NO.: DPT 0351-348-33 PROJECT NO.: 100552B PAGE 1 OF 1
 SITE: LC34 DATE: 9/10/12
 TOOLS AND METHOD: Macro Core DP BIT DIA: 2.3"
 TOTAL DEPTH: 60' GROUNDWATER DEPTH: 5' BLS
 DRILLING COMPANY: FDS RIG: Geoprobe 600PT
 DRILLERS: MIKE MILLER LOGGERS: D. Sizemore

LITHOLOGY LOG	GRAPHIC LOG	DEPTH SCALE	PID (ppm)	DRILLING LOG - Sample depths
Gray silty fine SAND w/ Frag shell (5%) sm	Core	31	1.5	
		32	2.5	
		33	3.1	
		34	2.5	
		35	5.0	-- Grab Sample collected @ 172-DPT 351-034.5
		36	5.1	
		37	4.9	-- Grab Sample collected @ 174-DPT 351-37.0
		38	5.4	
		39	9.3	
		40	2.7	-- Grab Sample collected @ 179-DPT 351-40.0
Gray CLAY w/ Frag. shell (1%) below 45.5' ch	Core	41	3.0	
		42	2.9	
		43	5.1	-- DMC sample collected @ 901 DPT 351-43.5-45.0
		44	4.8	-- Grab sample collected @ 913-DPT 351-45.5
		45	6.1	
Gray silty med SAND w/ Frag. shell (5%) sm below 49'	Core	46	0	-- Grab sample collected @ 919-DPT 351-47.0
		47	0	-- Grab sample collected @ 929-DPT 351-48.5
		48	0	
		49	0	
		50	0	
		51	0	
		52	0	
		53	0	-- Grab Sample collected @ 938 DPT 351-053.0
		54	0	
		55	0	
30'-40' on 9/10/12 40'-60' on 9/11/12	Core	56	0	
		57	0	
		58	0	
		59	0	
		60	0	

Boring term. @ 60' and abandoned w/ Grout
 DMC - 45' @ 901
 DMC - 47' @ 919
 * DMC sample @ 48' 5 collected @ 929

ATTACHMENT C-3

O&M FORMS

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joe Bartlett **Date:** 3/14/2011 **Time:** 1040

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	NA	
Collect water levels from injection wells	Monthly	NA	
Clean solar panels	As Needed	NA	
Clean flow meters	As Needed	NA	

Extraction Wells			Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.1	87	IJ0013	27	27	IJ0014	26	27
RW0008	2.3	87	IJ0015	26	27	IJ0016	27	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [divide total flow rate by 5 for rate for each well.]			IJ0017	26	27	IJ0018	22	27
			IJ0019	28	27	IJ0020	28	27
			IJ0021	28	27	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	14.28	100.00	
1b	13.63	100.00	replace PVC carbon bung connector with galvanized cast iron X3
2a	13.52	100.00	1 1/4" male thread - 3/4" female thread
2b	14.48	100.00	

Comments

Recycle Timer - red LED - slow steady blink - system ON; quick, short blink - system OFF

hide-a-key under right side of trailer door.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joe Bartlett **Date:** 3/21/2011 **Time:** 1700

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	NA	
Clean flow meters	As Needed	NA	

Extraction Wells		
	Flow Rate (gpm)	Volume Produced (gallons)
RW0007	2.3	16252
RW0008	2.6	14251

Injection Wells ²					
Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
IJ0013	24	27	IJ0014	30	28
IJ0015	26	27	IJ0016	28	28
IJ0017	26	26	IJ0018	22	27
IJ0019	25	27	IJ0020	31	28
IJ0021	26	27	IJ0022	26	28

1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period.
2. Use flow meters to distribute flow evenly between injection wells. [divide total flow rate by 5 for rate for each well.]

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.54	94.00	
1b	12.52	94.00	
2a	12.54	96.00	
2b	12.57	96.00	

Comments

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date:** 4/1/2011 **Time:** 1436

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells		
	Flow Rate (gpm)	Volume Produced (gallons)
RW0007	2.5	31048
RW0008	2.2	28078

Injection Wells ²					
Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
IJ0013	28	28	IJ0014	27	28
IJ0015	28	28	IJ0016	28	28
IJ0017	28	28	IJ0018	28	28
IJ0019	27	28	IJ0020	28	28
IJ0021	29	28	IJ0022	26	28

1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period.
2. Use flow meters to distribute flow evenly between injection wells. [divide total flow rate by 5 for rate for each well.]

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.57	92.00	
1b	12.56	96.00	
2a	12.49	92.00	
2b	12.49	92.00	

Comments

Carbon Effluent Samples collected at 1450 EW0007 - EF001, EW0008 - EF002

O&M not performed on 28 March due to weather (thunderstorms all week). Flow totalizer reading collected on 3/29/2011: EW0007 - 30723 gal., EW0008 - 27842 gal.



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date:** 4/7/2011 **Time:** 1442

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells		
	Flow Rate (gpm)	Volume Produced (gallons)
RW0007	2.5	40970
RW0008	2.5	35456

Injection Wells ²					
Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
IJ0013	28	28	IJ0014	30	30
IJ0015	28	28	IJ0016	30	30
IJ0017	28	28	IJ0018	30	30
IJ0019	28	28	IJ0020	30	30
IJ0021	28	28	IJ0022	30	30

1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period.
2. Use flow meters to distribute flow evenly between injection wells. [divide total flow rate by 5 for rate for each well.]

Battery	Voltage (V)	Percent Charge (%)	
1a	12.48	92.00	Task that need to be completed during the next scheduled visit
1b	12.46	92.00	
2a	13.34	100.00	
2b	13.20	100.00	

Comments

carbon changed

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joe Bartlett **Date:** 4/18/2011 **Time:** 900

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	No	System turned off at 0915 - baseline flux phase complete
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	Yes	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells		
	Flow Rate (gpm)	Volume Produced (gallons)
RW0007	2.4	58731
RW0008	2.2	44085

Injection Wells ²					
Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
IJ0013	27	27	IJ0014	24	26
IJ0015	27	27	IJ0016	24	26
IJ0017	28	27	IJ0018	25	26
IJ0019	28	27	IJ0020	25	26
IJ0021	25	27	IJ0022	24	26

1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period.
2. Use flow meters to distribute flow evenly between injection wells. [divide total flow rate by 5 for rate for each well.]

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	11.76	93.00	Install hour meters
1b	11.74	92.00	
2a	12.48	92.00	
2b	12.54	94.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date:** 8/9/2011 **Time:** 1100

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	system restarted after being shut down for injection activities
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	new filters installed
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	58,771	0	IJ0013	26	28	IJ0014	28	30
RW0008	2.8	44,113	0	IJ0015	30	28	IJ0016	26	30
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	28	IJ0018	32	30
				IJ0019	26	28	IJ0020	36	30
				IJ0021	28	28	IJ0022	32	30

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	13.98	100	
1b	13.56	100	
2a	13.69	100	
2b	13.85	100	

Comments

installed hour meters

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 08/12/2011** **Time: 0913**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	installed new filters, cleaned used filters off-site (hose bib previously used has been removed)
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	used DI water and pipe cleaner (left on-site)

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	65561	42.7	IJ0013	29	26	IJ0014	26	26
RW0008	2.6	51232	45.6	IJ0015	26	26	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	26	IJ0018	28	26
				IJ0019	26	26	IJ0020	26	26
				IJ0021	26	26	IJ0022	25	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	11.92	0.00	- 0% charge reading, however pumps are still operation. May be indication of problem with battery meter.
1b	11.92	0.00	
2a	11.79	0.00	
2b	11.80	0.00	

Comments

- significant biofouling (black/smokey colored groundwater) in RW0007 pipe lines

- minor biofouling in RW0008 pipe lines



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 08/18/2011** **Time: 0916**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	"load disconnect" light on charge controller suggesting battery charge reached 0%,
System operational on departure (yes/no)	Weekly	Yes	causing the system to shut off until 100% charge reached.
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	system forced ON by turning system off, then on using toggle switches and
Clean filters	Weekly	Yes	disconnecting/reconnecting battery terminals
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	

Extraction Wells				Injection Wells ²						
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	
	RW0007	2.3	74258	103.4	IJ0013	24	24	IJ0014	27	28
	RW0008	2.6	59187	98.9	IJ0015	24	24	IJ0016	30	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]					IJ0017	26	24	IJ0018	27	28
					IJ0019	27	24	IJ0020	28	28
					IJ0021	20	24	IJ0022	26	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.08	25.00	charge read at 1130 to observe charging rate:
1b	12.08	25.00	1a - 12.30 V, 61%
2a	11.96	6.00	1b - 12.24 V, 51%
2b	11.96	6.00	2a - 12.04 V, 18%
			2b - 12.04 V, 18%

Comments

IDW - pallet #: 183809, drum #: 183866

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 08/24/2011** **Time: 1040**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	load disconnect light on
System operational on departure (yes/no)	Weekly	Yes	forced on by disconnecting/reconnecting battery terminals
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.4	82434	161.5	IJ0013	24	24	IJ0014	30	28
RW0008	2.6	67015	151.5	IJ0015	24	24	IJ0016	28	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	20	24	IJ0018	28	28
				IJ0019	26	24	IJ0020	30	28
				IJ0021	28	24	IJ0022	26	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.27	56.00	
1b	12.24	51.00	
2a	12.19	45.00	
2b	12.20	45.00	

Comments

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 08/31/2011** **Time: 0930**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	load disconnect light on - Forced system on
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.4	90012	214.3	IJ0013	26	25	IJ0014	27	27
RW0008	2.5	74235	199.6	IJ0015	25	25	IJ0016	27	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	25	IJ0018	29	27
				IJ0019	26	25	IJ0020	23	27
				IJ0021	24	25	IJ0022	30	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.33	66.00	
1b	12.33	66.00	
2a	12.33	66.00	
2b	12.35	66.00	

Comments

- collected data logger data

- data logger in RW0008 gone, most likely fell to bottom of well

- pulled RW0008 pump out, data logger attached

- repaired fencing

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 09/08/2011** **Time: 0940**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	Load disconnect light on - forced on
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	101352	288.8	IJ0013	27	26	IJ0014	28	27
RW0008	2.6	84039	265.7	IJ0015	26	26	IJ0016	27	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	26	IJ0018	26	27
				IJ0019	26	26	IJ0020	26	27
				IJ0021	22	26	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.17	39.00	need to order more filters soon: Flow max pleated filter cartridge. 2 3/4" dia., 20 micron
1b	12.14	32.00	
2a	12.16	39.00	
2b	12.17	39.00	

Comments

Battery Analyzer: Argus Analyzer, model # AA350.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 09/15/2011** **Time: 1422**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters.
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	112997	365.1	IJ0013	25	28	IJ0014	27	26
RW0008	2.4	94424	335.7	IJ0015	26	28	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	28	IJ0018	27	26
				IJ0019	23	27	IJ0020	29	26
				IJ0021	38	28	IJ0022	24	26

Battery	Voltage (V)	Percent Charge (%)	
1a	12.67	94.00	Task that need to be completed during the next scheduled visit
1b	12.73	96.00	
2a	12.70	96.00	
2b	12.73	98.00	

Comments

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 09/22/11** **Time: 0952**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	load disconnect light on
System operational on departure (yes/no)	Weekly	Yes	forced on
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	123841	436.4	IJ0013	28	27	IJ0014	26	27
RW0008	2.6	103828	400	IJ0015	27	27	IJ0016	27	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	26	IJ0018	23	27
				IJ0019	26	27	IJ0020	28	27
				IJ0021	28	27	IJ0022	27	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.08	25.00	
1b	12.11	25.00	
2a	12.08	25.00	
2b	12.11	25.00	

Comments

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 09/28/11** **Time: 1236**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	132387	492.5	IJ0013	25	27	IJ0014	27	27
RW0008	2.6	111063	449.5	IJ0015	30	27	IJ0016	27	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	27	IJ0018	28	27
				IJ0019	32	27	IJ0020	26	27
				IJ0021	22	27	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.48	71.00	
1b	12.48	84.00	
2a	12.43	76.00	
2b	12.46	80.00	

Comments

collected data from data loggers, redeployed



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 10/05/11** **Time: 0935**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	Load disconnect light on
System operational on departure (yes/no)	Weekly	Yes	Forced on
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	144138	569.8	IJ0013	28	27	IJ0014	27	27
RW0008	2.6	121025	518	IJ0015	24	27	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	26	IJ0018	26	27
				IJ0019	25	27	IJ0020	28	27
				IJ0021	29	27	IJ0022	26	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	11.96	6.00	
1b	11.96	6.00	
2a	11.95	2.00	
2b	11.95	2.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 10/13/11** **Time: 1046**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	153299	629.2	IJ0013	27	27	IJ0014	26	28
RW0008	2.6	129060	571.8	IJ0015	30	27	IJ0016	28	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	26	IJ0018	28	28
				IJ0019	27	27	IJ0020	27	28
				IJ0021	25	27	IJ0022	28	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.11	32.00	
1b	12.08	25.00	
2a	12.20	45.00	
2b	12.22	51.00	

Comments

Fence repaired

overcast weather during week

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 10/20/11** **Time: 1219**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	160697	676.7	IJ0013	30	29	IJ0014	28	27
RW0008	2.6	135468	612.7	IJ0015	26	29	IJ0016	26	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	28	28	IJ0018	27	27
				IJ0019	27	29	IJ0020	27	27
				IJ0021	31	29	IJ0022	26	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.84	100.00	
1b	12.81	100.00	
2a	12.75	98.00	
2b	12.78	100.00	

Comments

overcast weather during week

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 10/27/11** **Time: 1233**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	172662	754.6	IJ0013	26	28	IJ0014	26	27
RW0008	2.6	145857	678.4	IJ0015	30	28	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	28	IJ0018	28	27
				IJ0019	28	28	IJ0020	28	27
				IJ0021	28	28	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.35	66.00	
1b	12.35	71.00	
2a	12.62	92.00	
2b	12.65	94.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 11/03/11** **Time: 1408**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with new filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	180418	805.1	IJ0013	30	28	IJ0014	26	27
RW0008	2.6	153165	726.5	IJ0015	27	28	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	28	IJ0018	27	27
				IJ0019	30	28	IJ0020	25	27
				IJ0021	26	28	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.16	51.00	
1b	12.24	51.00	
2a	12.27	56.00	
2b	12.27	56.00	

Comments

Water accumulation in IJ17 & 18 vault box. Leaking water funneled into vault box through secondary containment tubing. Approx. 5 gallons from vault box poured

into IDW drum # 185539. Repaired leak at male-male connector by applying additional hose clamps.

Repaired leaking manifold tubing.

Collected Datalogger data.



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 11/10/11** **Time: 1155**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	188701	859.9	IJ0013	26	26	IJ0014	28	27
RW0008	2.6	160793	776.7	IJ0015	26	26	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	26	IJ0018	28	27
				IJ0019	24	26	IJ0020	27	27
				IJ0021	26	26	IJ0022	26	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.86	100.00	
1b	12.89	100.00	
2a	12.81	100.00	
2b	12.81	100.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 11/17/11** **Time: 0857**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	Load Disconnect' light on
System operational on departure (yes/no)	Weekly	Yes	Forced on
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	New filters installed
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	199088	928.0	IJ0013	28	27	IJ0014	28	27
RW0008	2.6	170200	838.7	IJ0015	29	27	IJ0016	28	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	27	IJ0018	28	27
				IJ0019	26	27	IJ0020	25	27
				IJ0021	26	27	IJ0022	30	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.28	56.00	
1b	12.28	56.00	
2a	12.08	25.00	
2b	12.08	25.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 11/22/11** **Time: 1232**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	205617	970.2	IJ0013	28	27	IJ0014	27	26
RW0008	2.5	175870	876.3	IJ0015	26	27	IJ0016	28	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	25	26	IJ0018	30	26
				IJ0019	26	27	IJ0020	24	26
				IJ0021	28	27	IJ0022	24	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.94	100.00	
1b	12.67	94.00	
2a	12.52	87.00	
2b	12.52	84.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 12/1/11** **Time: 0920**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	216612	1043.1	IJ0013	26	27	IJ0014	25	26
RW0008	2.6	185735	940.6	IJ0015	26	27	IJ0016	28	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	27	IJ0018	26	26
				IJ0019	27	27	IJ0020	26	26
				IJ0021	26	27	IJ0022	26	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.04	11.00	
1b	12.03	11.00	
2a	12.48	84.00	
2b	12.48	84.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 12/7/11** **Time: 1007**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	225042	1097.6	IJ0013	27	28	IJ0014	26	27
RW0008	2.6	193040	987.3	IJ0015	30	28	IJ0016	26	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	27	IJ0018	27	27
				IJ0019	26	28	IJ0020	27	27
				IJ0021	29	28	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.14	39.00	
1b	12.14	39.00	
2a	12.46	80.00	
2b	12.48	80.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 12/15/11** **Time: 1202**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	"Load Disconnect" light on
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	232700	1147.3	IJ0013	26	26	IJ0014	27	27
RW0008	2.6	199720	1030.0	IJ0015	26	26	IJ0016	26	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	25	26	IJ0018	27	27
				IJ0019	27	26	IJ0020	27	27
				IJ0021	27	26	IJ0022	26	27

Battery	Voltage (V)	Percent Charge (%)	
			Task that need to be completed during the next scheduled visit
1a	12.28	56.00	
1b	12.27	56.00	
2a	12.27	51.00	
2b	12.28	56.00	

Comments

Weather - 70s, overcast



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 12/22/11** **Time: 1040**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	"load disconnect" light on
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	240538	1198.6	IJ0013	28	26	IJ0014	26	27
RW0008	2.5	206694	1074.8	IJ0015	25	26	IJ0016	28	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	26	IJ0018	26	27
				IJ0019	26	26	IJ0020	26	27
				IJ0021	26	26	IJ0022	26	27

Battery	Voltage (V)	Percent Charge (%)	
			Task that need to be completed during the next scheduled visit
1a	12.27	56.00	
1b	12.28	56.00	
2a	12.22	51.00	
2b	12.28	56.00	

Comments

data logger data collected

weather: 70s, overcast

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 1/5/12** **Time: 1534**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	RW7 not running; RW8 running
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	249543	1298.4	IJ0013	30	28	IJ0014	28	27
RW0008	2.6	222277	1175.3	IJ0015	28	28	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	28	28	IJ0018	27	27
				IJ0019	27	28	IJ0020	28	27
				IJ0021	28	28	IJ0022	27	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	13.21	100.00	
1b	13.26	100.00	
2a	12.56	90.00	
2b	12.59	90.00	

Comments

- Upon arrival, RW7 pump was not running. Inspected wiring - ok. Switched source wiring, pump was not responsive.

The pump has reached The end of its useful life. Replaced pump for RW7 with spare.

- Repaired construction fencing.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: Joseph Bartlett **Date: 1/16/12** **Time: 0953**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	265098	1398.5	IJ0013	25	28	IJ0014	26	26
RW0008	2.5	234235	1252.6	IJ0015	29	28	IJ0016	25	24
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	27	IJ0018	26	26
				IJ0019	28	28	IJ0020	26	26
				IJ0021	26	28	IJ0022	25	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.11	25.00	
1b	12.09	25.00	
2a	12.01	11.00	
2b	12.03	11.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 1/26/12** **Time: 1230**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	Yes	see below
Clean solar panels	As Needed	Yes	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	279302	1489.8	IJ0013	32	28	IJ0014	27	27
RW0008	2.6	246358	1332.2	IJ0015	27	28	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	28	IJ0018	27	27
				IJ0019	28	28	IJ0020	28	27
				IJ0021	30	28	IJ0022	29	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.46	80.00	
1b	12.46	80.00	
2a	12.72	96.00	
2b	12.72	96.00	

Comments

Collected data logger levels. Collected groundwater levels manually at time of data logger collection (system was on during time of collection):

RW07: 12.78 ft BTOC @ 1259; RW08: 23.12 ft BTOC @ 1311; IW2D1: 6.21 ft BTOC @ 1318; IW2D: 5.85 ft BTOC @ 1325; IJ17: 4.67 ft BTOC @ 1335

IJ18: 3.77 ft BTOC @ 1342; IJ13: 3.67 ft BTOC @ 1349; IJ14: 5.96 ft BTOC @ 1400

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J Bartlett **Date: 2/6/12** **Time: 1407**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	293427	1580.5	IJ0013	26	28	IJ0014	26	27
RW0008	2.6	258227	1411.1	IJ0015	30	28	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	29	29	IJ0018	27	27
				IJ0019	31	28	IJ0020	27	27
				IJ0021	26	28	IJ0022	27	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.54	87.00	
1b	12.54	87.00	
2a	12.64	92.00	
2b	12.67	94.00	

Comments

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J Bartlett **Date: 2/14/12** **Time: 0923**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	No	system will be restarted 2/17/12
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	302185	1636.7	IJ0013	30	27	IJ0014	26	26
RW0008	2.5	265760	1461.2	IJ0015	24	27	IJ0016	26	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	28	27	IJ0018	26	26
				IJ0019	24	27	IJ0020	26	26
				IJ0021	28	27	IJ0022	26	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.12	32.00	
1b	12.11	32.00	
2a	12.08	25.00	
2b	12.09	25.00	

Comments

Data logger data collected 2/16/2012.

Water levels - IJ13: 5.85 ft BTOC @ 0921 (unable to collect data logger data - connection timed out); IJ14: 6.10 ft BTOC @ 1222; IW2D1: 6.28 ft BTOC @ 1231

IW2D: 6.14 ft BTOC @ 1239; RW7: 5.47 ft BTOC @ 1245; RW8: 5.33 ft BTOC @ 1253; IJ17: 5.43 ft BTOC @ 1302; IJ18: 5.70 ft BTOC @ 1307



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J Bartlett **Date: 3/2/12** **Time: 1030**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	322727	1768.6	IJ0013	26	28	IJ0014	26	27
RW0008	2.6	283067	1574.2	IJ0015	30	28	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	27	28	IJ0018	26	27
				IJ0019	29	28	IJ0020	28	27
				IJ0021	27	28	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	
1a	12.44	76.00	Task that need to be completed during the next scheduled visit
1b	12.46	80.00	
2a	12.56	87.00	
2b	12.59	90.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 3/15/12** **Time: 1300**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	RW7 not running, RW8 running
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.8	328054	1957.4	IJ0013	29	30	IJ0014	28	28
RW0008	2.6	299640	1681.9	IJ0015	32	30	IJ0016	28	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	30	IJ0018	28	28
				IJ0019	30	30	IJ0020	28	28
				IJ0021	32	30	IJ0022	28	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	14.06	100.00	
1b	13.72	100.00	
2a	12.60	90.00	
2b	12.64	92.00	

Comments

Replaced pump for RW0007



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 4/5/12** **Time: 1300**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	RW8 pumping; RW7 off
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.7	347393	2210.5	IJ0013	30	30	IJ0014	28	28
RW0008	2.6	330755	1881.4	IJ0015	28	30	IJ0016	28	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	30	29	IJ0018	28	28
				IJ0019	30	30	IJ0020	28	28
				IJ0021	28	30	IJ0022	28	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	13.69	100.00	
1b	13.71	100.00	
2a	12.76	98.00	
2b	12.75	98.00	

Comments

Tubing for RW7 had slipped off of 90° located at well top of casing. Will calculate operating time using flow. When reconnected, observed pumping rate to be very slow. Pulled pump, noticed thick cake layer on sediment sock on pump. Washed off and redeployed pump. Flow observed to be normal after cleaning.

Leaking for manifold, replaced cracked tubing segments.

Collected data logger data and removed all data loggers except 2 remaining in RW7 and RW8.

Repaired construction fencing.



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 4/19/12** **Time: 1025**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	368404	2346	IJ0013	26	26	IJ0014	25	26
RW0008	2.5	349626	2001	IJ0015	27	26	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	26	IJ0018	25	26
				IJ0019	24	26	IJ0020	26	26
				IJ0021	24	26	IJ0022	26	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.16	39.00	
1b	12.12	25.00	
2a	12.56	87.00	
2b	12.60	90.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 5/4/12** **Time: 1055**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	391657	2496.5	IJ0013	26	27	IJ0014	28	27
RW0008	2.6	370668	2135.4	IJ0015	28	27	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	27	IJ0018	28	27
				IJ0019	30	27	IJ0020	28	27
				IJ0021	28	27	IJ0022	27	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.43	80.00	
1b	12.43	76.00	
2a	12.52	84.00	
2b	12.56	87.00	

Comments

repaired cracked manifold hose.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 5/17/12** **Time: 0936**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	407750	2601.8	IJ0013	26	28	IJ0014	27	27
RW0008	2.5	386050	2234.7	IJ0015	26	28	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	25	27	IJ0018	27	27
				IJ0019	26	28	IJ0020	26	27
				IJ0021	28	28	IJ0022	28	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.17	45.00	
1b	12.17	39.00	
2a	12.30	66.00	
2b	12.36	71.00	

Comments

- cleaned sediment sock for RW0007 after observing lower than normal flow.

- measurements were collected after cleaning of the sediment sock for RW07

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 6/7/12** **Time: 0851**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	Load disconnect light on
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	434684	2778.9	IJ0013	22	27	IJ0014	26	26
RW0008	2.5	411500	2400.1	IJ0015	26	27	IJ0016	26	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	26	IJ0018	26	27
				IJ0019	28	26	IJ0020	28	26
				IJ0021	26	26	IJ0022	28	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.27	56.00	
1b	12.24	51.00	
2a	12.30	66.00	
2b	12.33	66.00	

Comments

- weather overcast, 70s

- repaired leaking segment of manifold



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 6/21/12** **Time: 1230**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	Both pumps down upon arrival
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.6	445425	2932.7	IJ0013	26	26	IJ0014	32	28
RW0008	2.6	420846	2517.7	IJ0015	28	26	IJ0016	30	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	28	27	IJ0018	32	28
				IJ0019	26	26	IJ0020	26	28
				IJ0021	29	26	IJ0022	28	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.89	100.00	
1b	13.05	100.00	
2a	13.61	100.00	
2b	13.68	100.00	

Comments

- checked wiring for pump RW7, pulled pumps and tested by hooking directly to battery - noise like motor is trying to turn, but jammed. Replaced pump for RW7.

- checked wiring for pump RW8, pulled pump and tested - unresponsive. Replaced pump for RW8

- repaired leaking manifold tubing.

- readings collected at 1555.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 7/10/12** **Time: 1005**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	RW7 running, RW8 not running.
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	No	
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	471,010	3106.7	IJ0013	32	26	IJ0014	28	28
RW0008	2.6	434,550	2681.1	IJ0015	26	26	IJ0016	28	28
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	24	25	IJ0018	28	28
				IJ0019	25	26	IJ0020	28	28
				IJ0021	25	26	IJ0022	28	28

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.27	61.00	
1b	12.28	56.00	
2a	12.88	100.00	
2b	12.89	100.00	

Comments

- Inspected piping in RW8, pipe was disconnected at elbow at TOC of RW. Hose clamp must have rusted through and fell off. Reconnected piping and replaced hose clamp. System operated normally.

- Cleared tall grass and weeds from wells and piping runs.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 7/19/12** **Time: 0926**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	Yes	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.4	481880	3180.9	IJ0013	25	25	IJ0014	25	26
RW0008	2.5	445710	2753.0	IJ0015	24	25	IJ0016	24	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	25	IJ0018	26	26
				IJ0019	22	25	IJ0020	24	26
				IJ0021	27	25	IJ0022	25	26

Battery	Voltage (V)	Percent Charge (%)	
			Task that need to be completed during the next scheduled visit
1a	12.38	71.00	
1b	12.36	71.00	
2a	12.59	90.00	
2b	12.62	92.00	

Comments



Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 8/2/12** **Time: 0920**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	No	"load disconnect" light on
System operational on departure (yes/no)	Weekly	Yes	forced on by disconnecting/reconnecting battery terminals
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.4	500950	3311.7	IJ0013	26	25	IJ0014	27	26
RW0008	2.5	464280	2870.3	IJ0015	25	25	IJ0016	25	26
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	22	25	IJ0018	26	26
				IJ0019	26	25	IJ0020	26	26
				IJ0021	26	25	IJ0022	26	26

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.32	51.00	
1b	12.25	45.00	
2a	12.64	66.00	
2b	12.64	90.00	

Comments

Drums remaining onsite: Pallet 183805 - Drums 183808, 183807; Pallet 185408 - Drums 190485, 188680

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 8/16/12** **Time: 1350**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	Replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.5	519394	3438.5	IJ0013	25	26	IJ0014	30	29
RW0008	2.6	482120	2981.1	IJ0015	26	26	IJ0016	30	29
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	26	26	IJ0018	28	29
				IJ0019	24	26	IJ0020	28	29
				IJ0021	24	26	IJ0022	28	29

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.65	94.00	
1b	12.65	92.00	
2a	13.02	100.00	
2b	12.94	92.00	

Comments

Repaired leaking manifold tubing.

Launch Complex 34 O&M

Launch Complex 34, SWMU CC054
Cape Canaveral Air Force Station, Florida

Technician: J. Bartlett **Date: 09/06/12** **Time: 1000**

Maintenance & Monitoring

Item	Frequency	Completed (yes/no)	Comments or Notes
System operational on arrival (yes/no) ¹	Weekly	Yes	
System operational on departure (yes/no)	Weekly	Yes	
Inspect wiring and connection	Bi-weekly	Yes	
Inspect piping and connections for leaks	Weekly	Yes	
Clean filters	Weekly	Yes	replaced with cleaned filters
Collect water levels from injection wells	Monthly	No	
Clean solar panels	As Needed	No	
Clean flow meters	As Needed	No	

Extraction Wells				Injection Wells ²					
	Flow Rate (gpm)	Volume Produced (gallons)	Hour Meter Reading (hours)	Shallow (32-42 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final	Deep (47-57 ft BLS)	Flow Rate (gph) Initial	Flow Rate (gph) Final
RW0007	2.4	543077	3605.6	IJ0013	22	24	IJ0014	28	27
RW0008	2.6	504939	3120.5	IJ0015	25	24	IJ0016	26	27
1. System on a recycle timer set for 40 min/20 min off. If system is off, make sure system is not in 20 min off period. 2. Use flow meters to distribute flow evenly between injection wells. [multiply total flow rate (gpm) by 12 for rate for each well (gph).]				IJ0017	23	24	IJ0018	28	27
				IJ0019	24	24	IJ0020	28	27
				IJ0021	24	24	IJ0022	27	27

Battery	Voltage (V)	Percent Charge (%)	Task that need to be completed during the next scheduled visit
1a	12.28	56.00	
1b	12.24	51.00	
2a	12.59	90.00	
2b	12.59	90.00	

Comments

repaired leaking manifold tubing

marked locations for 12 mth DPT soil sampling

utility locate with Sean O'Brien and Eddie Crayton

ATTACHMENT C-4
HYDROGRAPHS

Figure C-4-1A

Water Level in RW0007. Month 2. September 2011

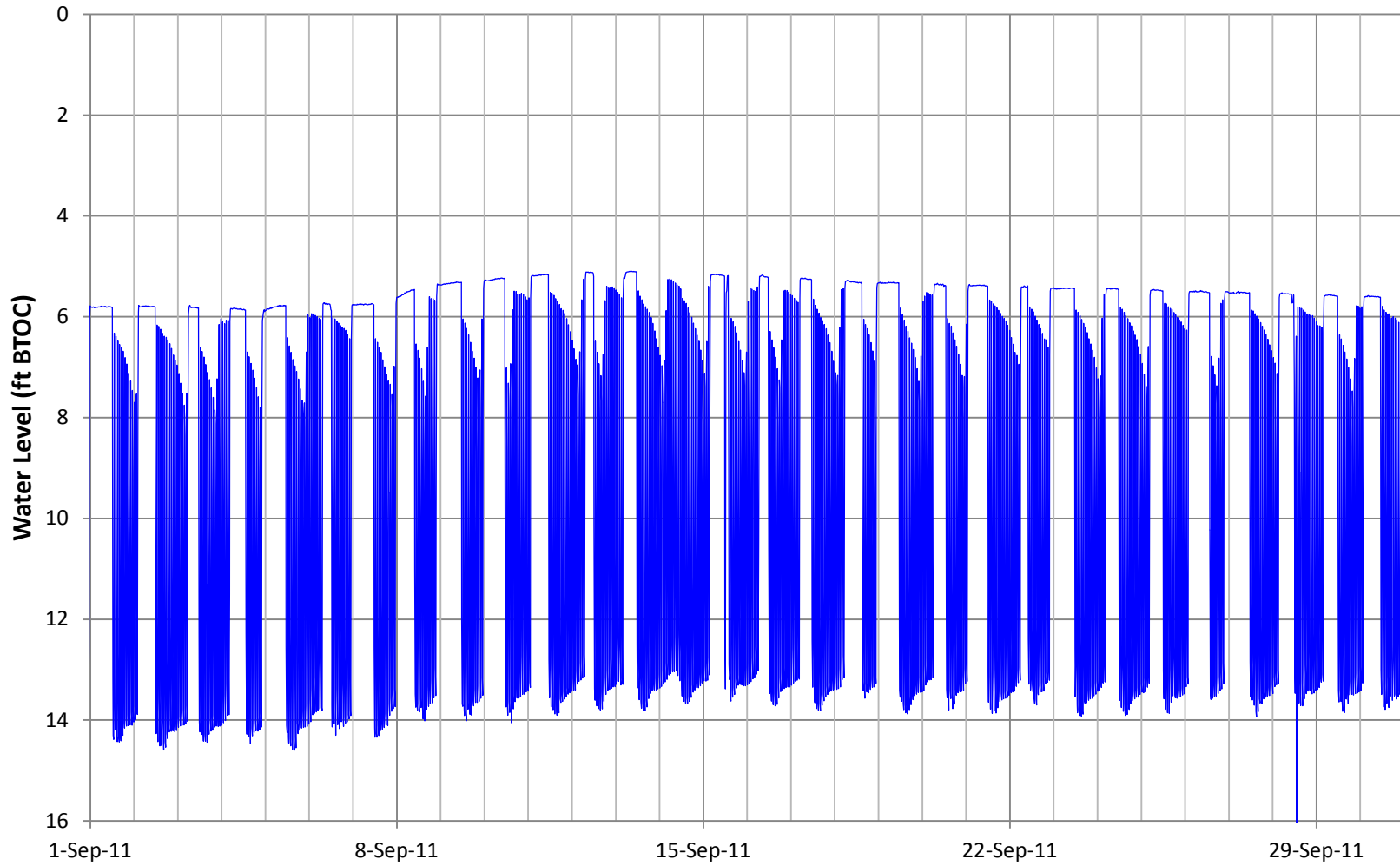


Figure C-4-1B

Water Level in RW0007. Month 3. October 2011

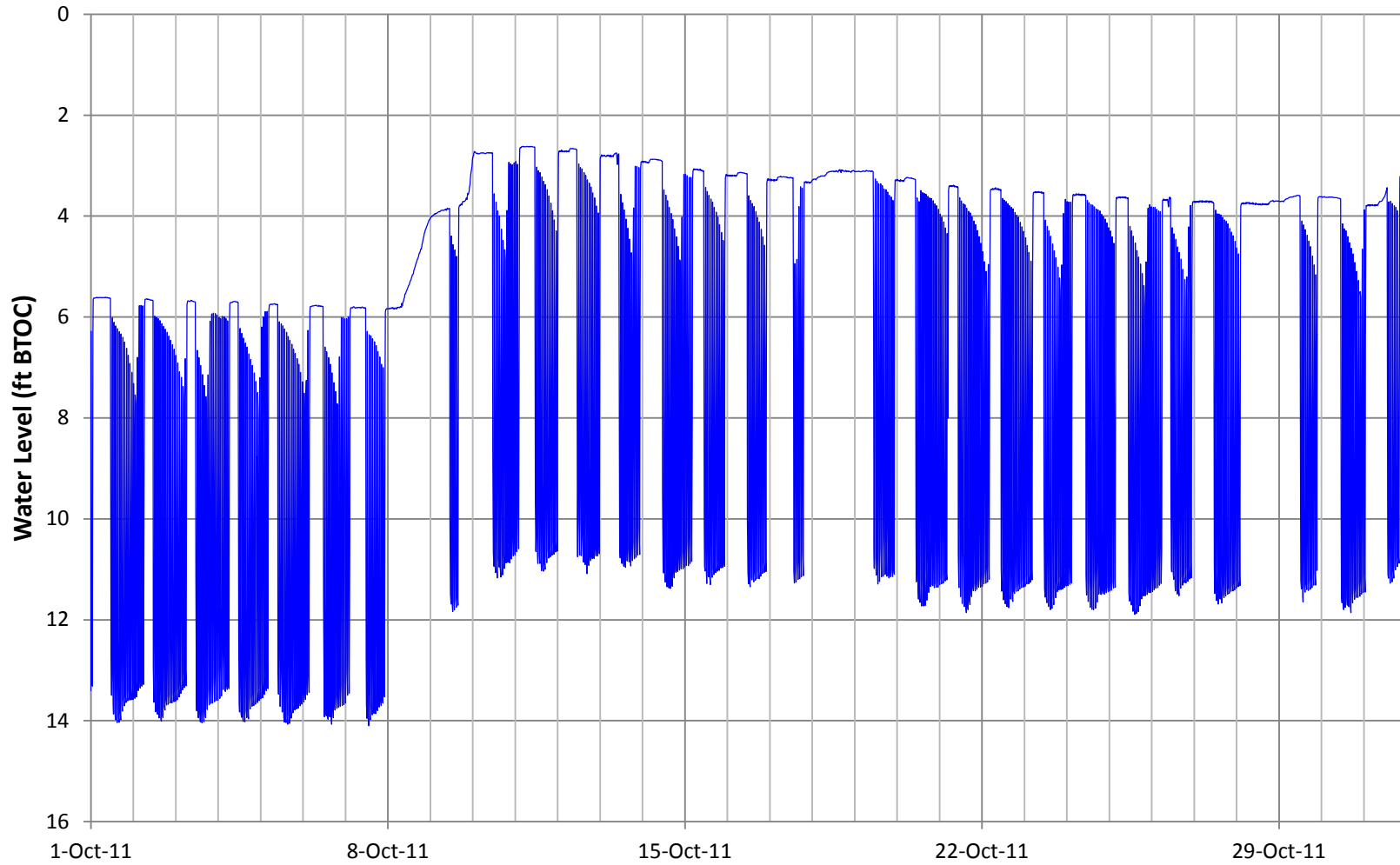


Figure C-4-1C

Water Level in RW0007. Month 4. November 2011

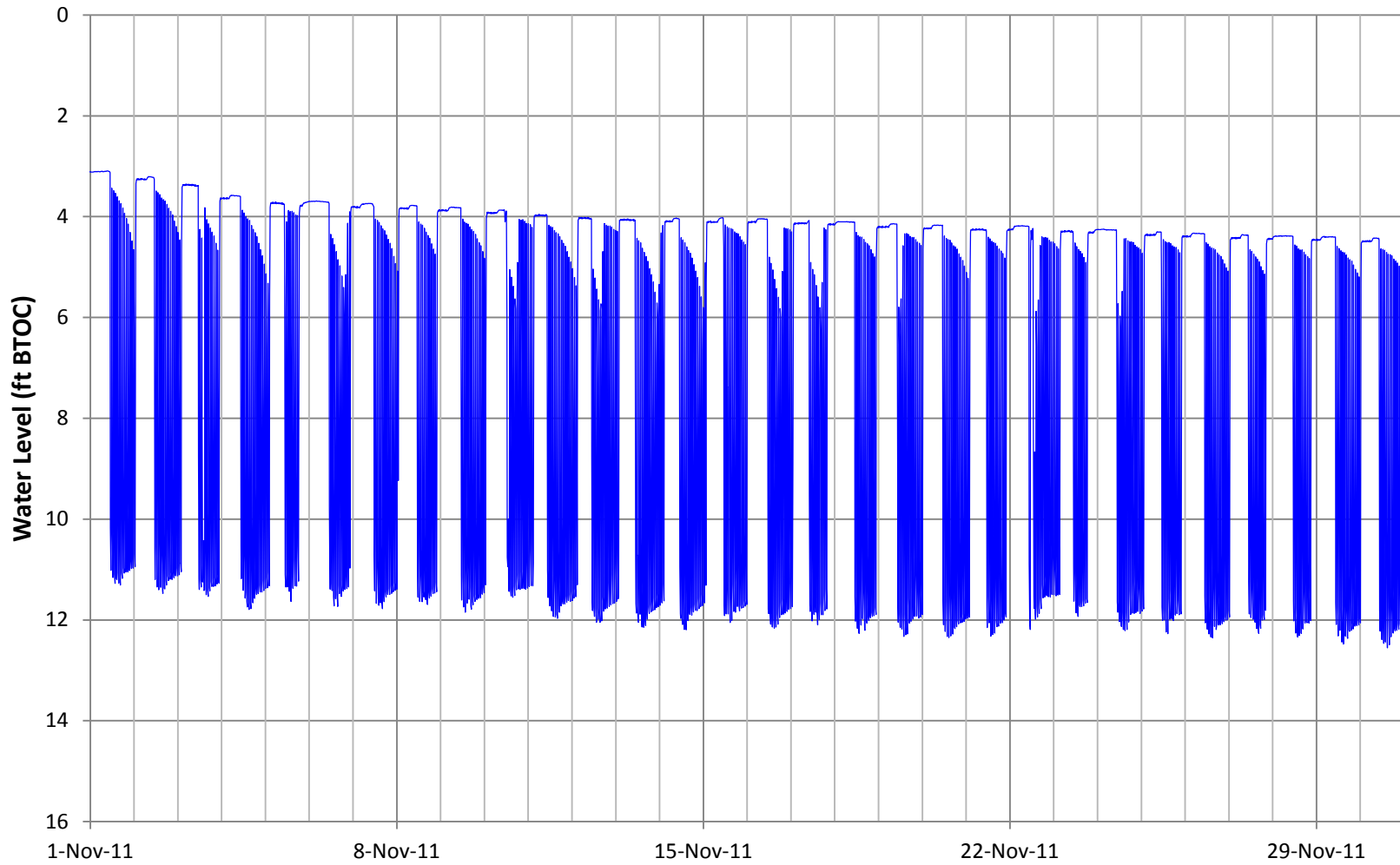


Figure C-4-1D

Water Level in RW0007. Month 5. December 2011

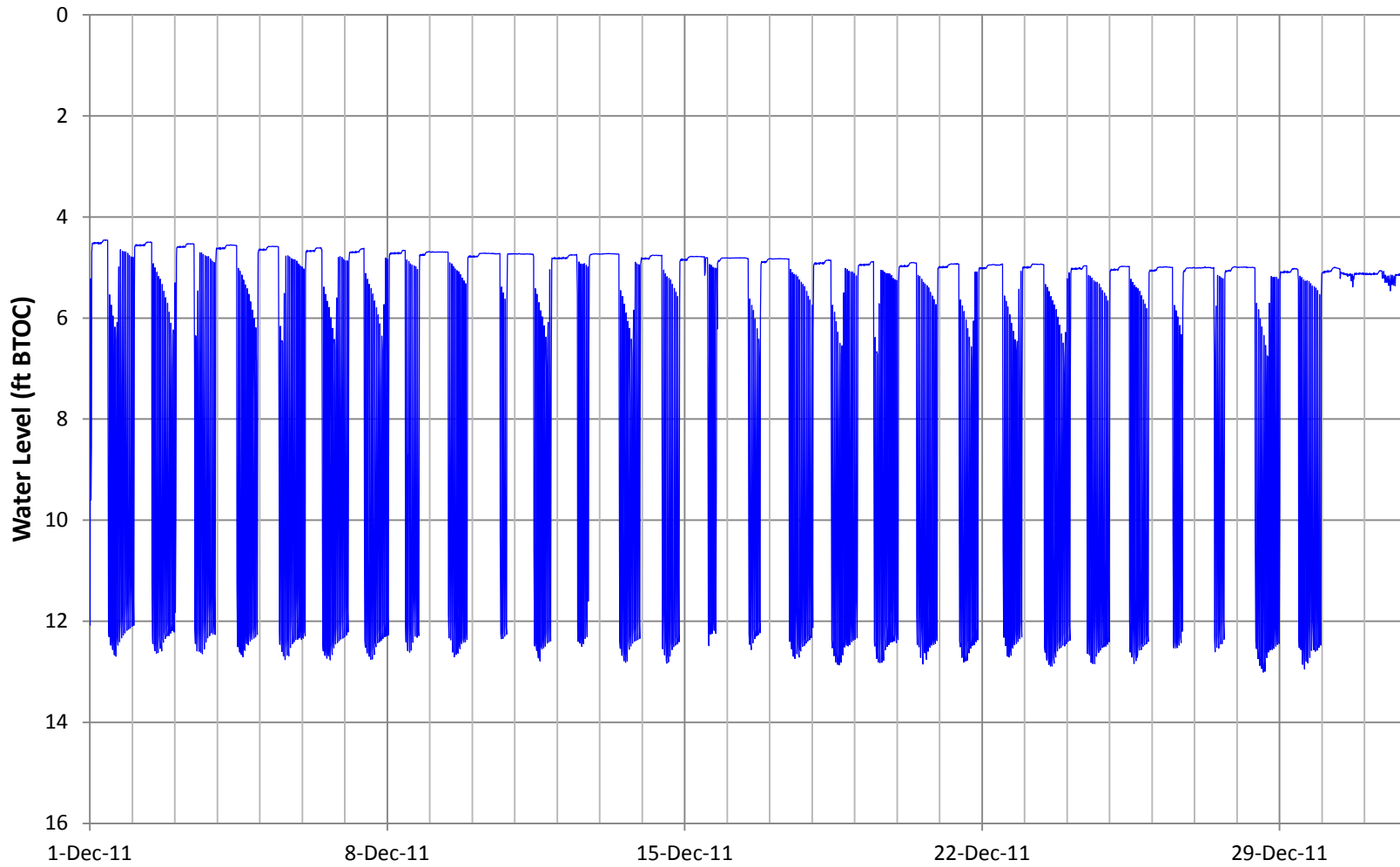


Figure C-4-1E

Water Level in RW0007. Month 6. January 2012

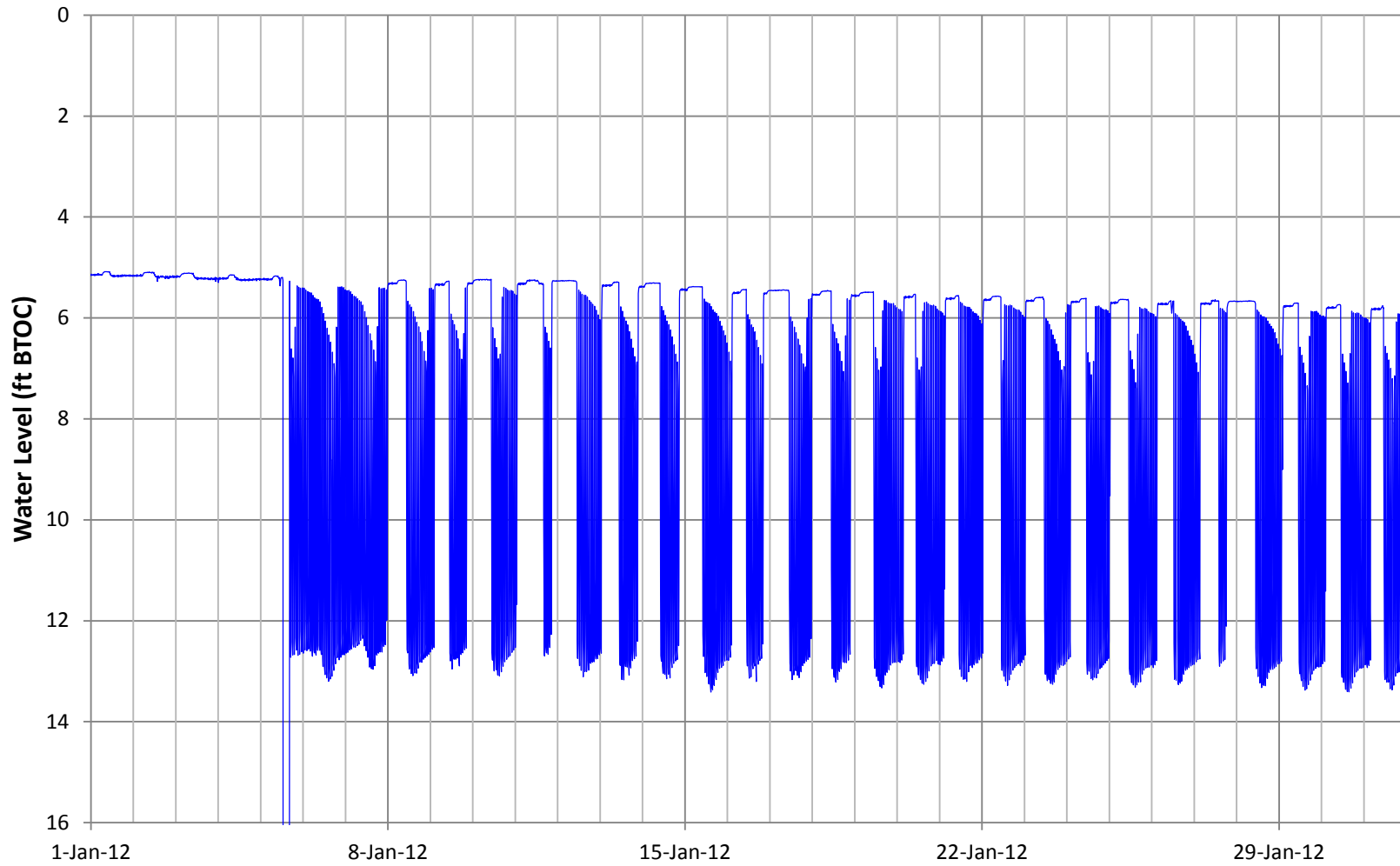


Figure C-4-1F

Water Level in RW0007. Month 7. February 2012

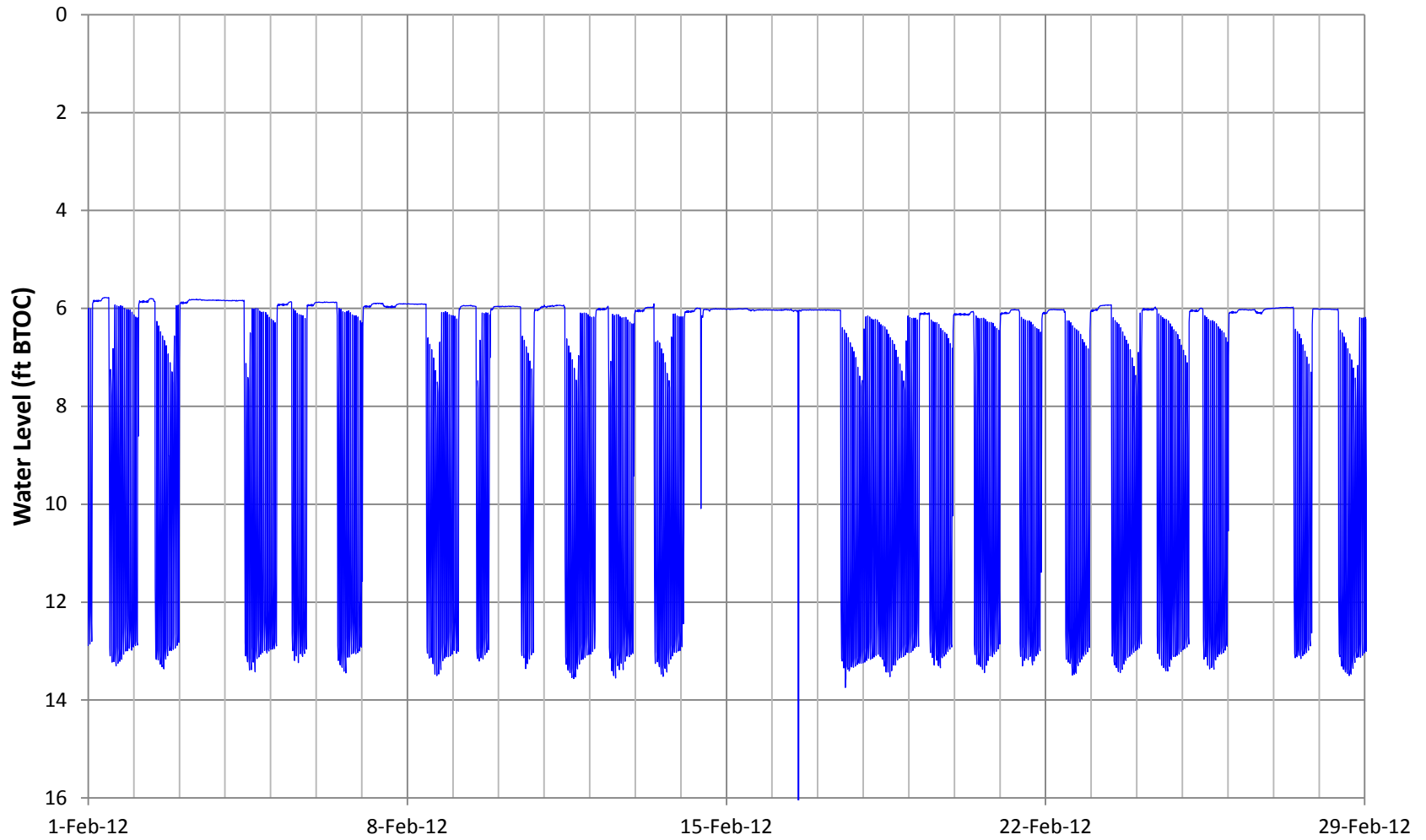


Figure C-4-1G

Water Level in RW0007. Month 8. March 2012

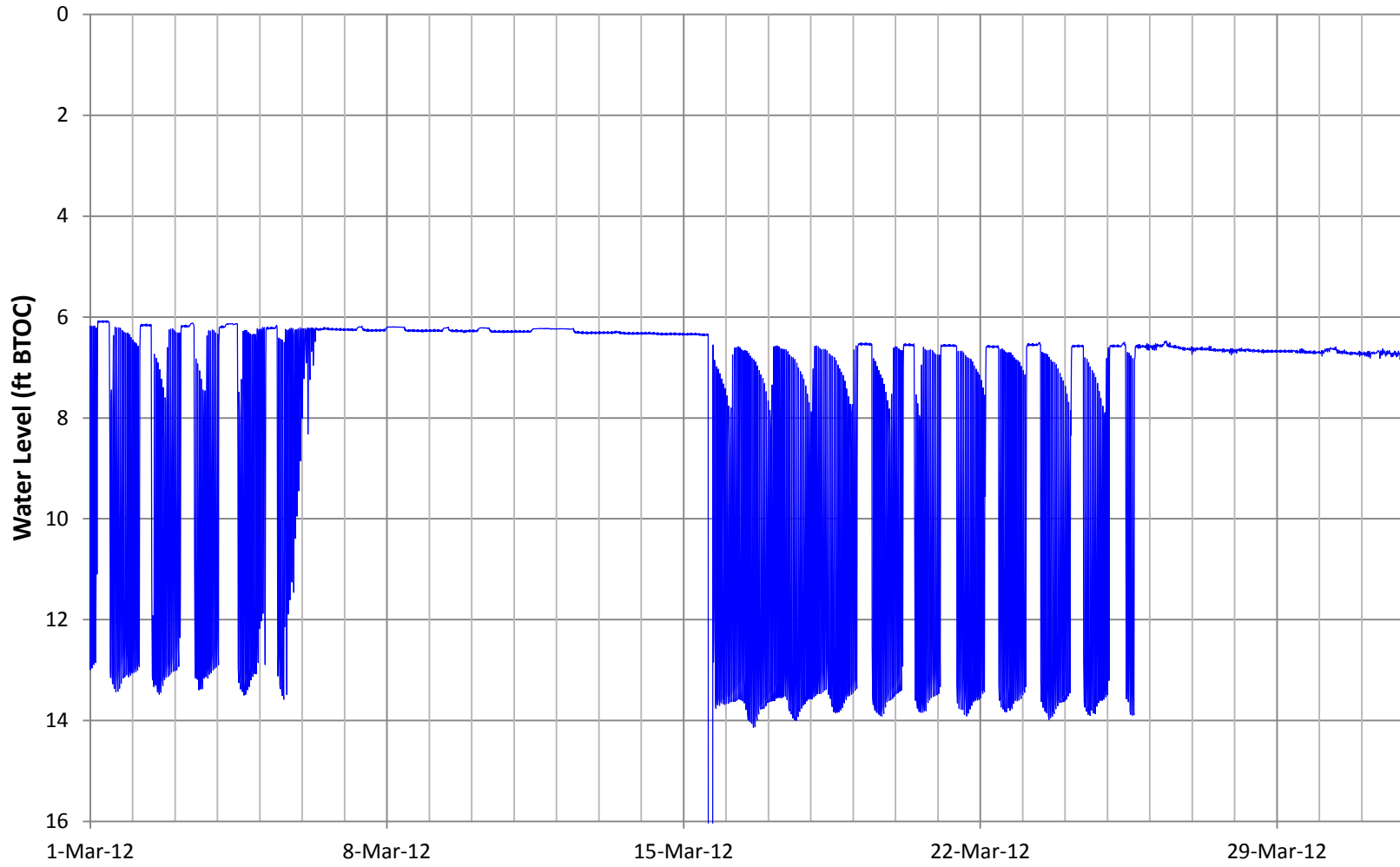


Figure C-4-1H

Water Level in RW0007. Month 9. April 2012

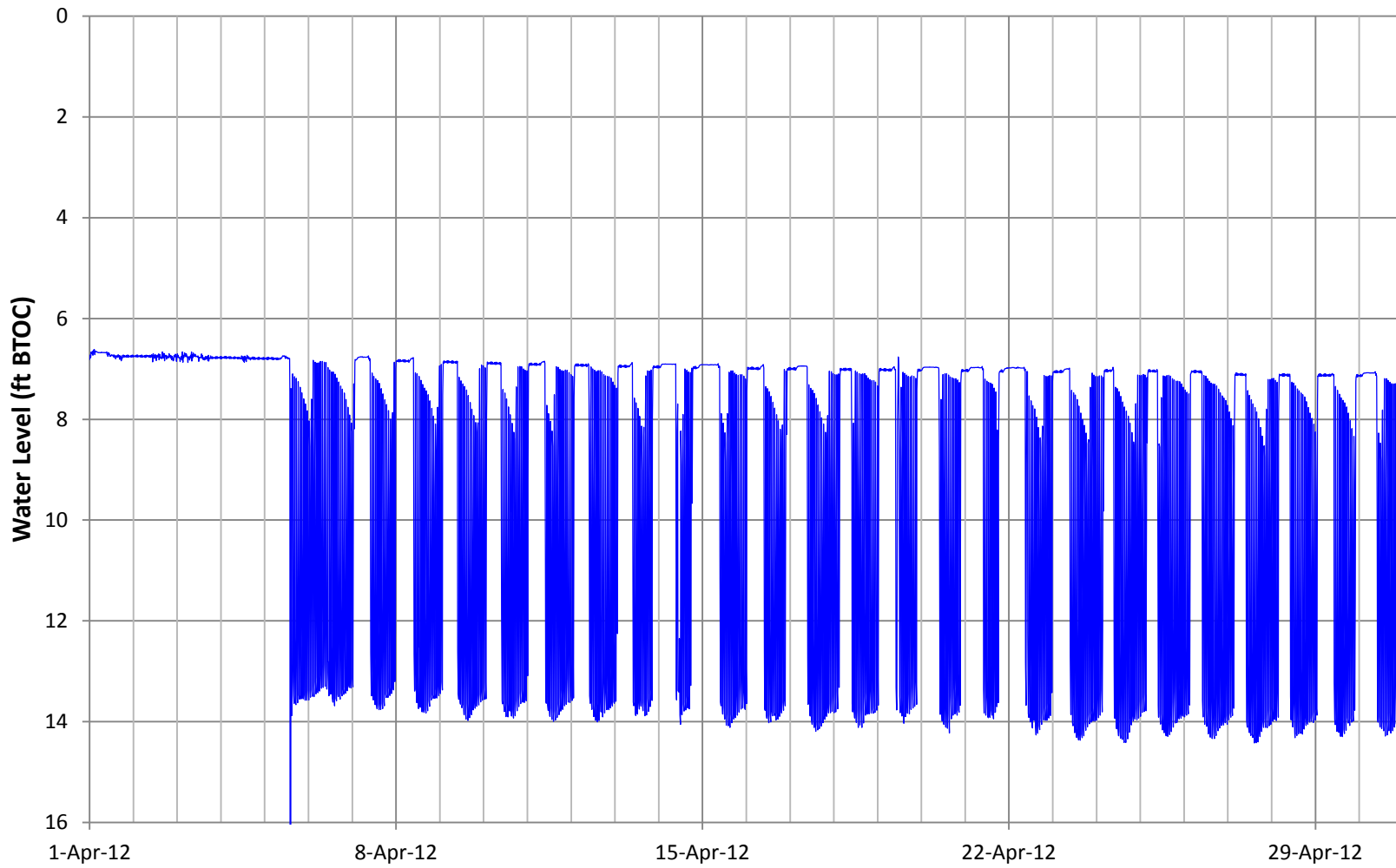


Figure C-4-1I

Water Level in RW0007. Month 10. May 2012

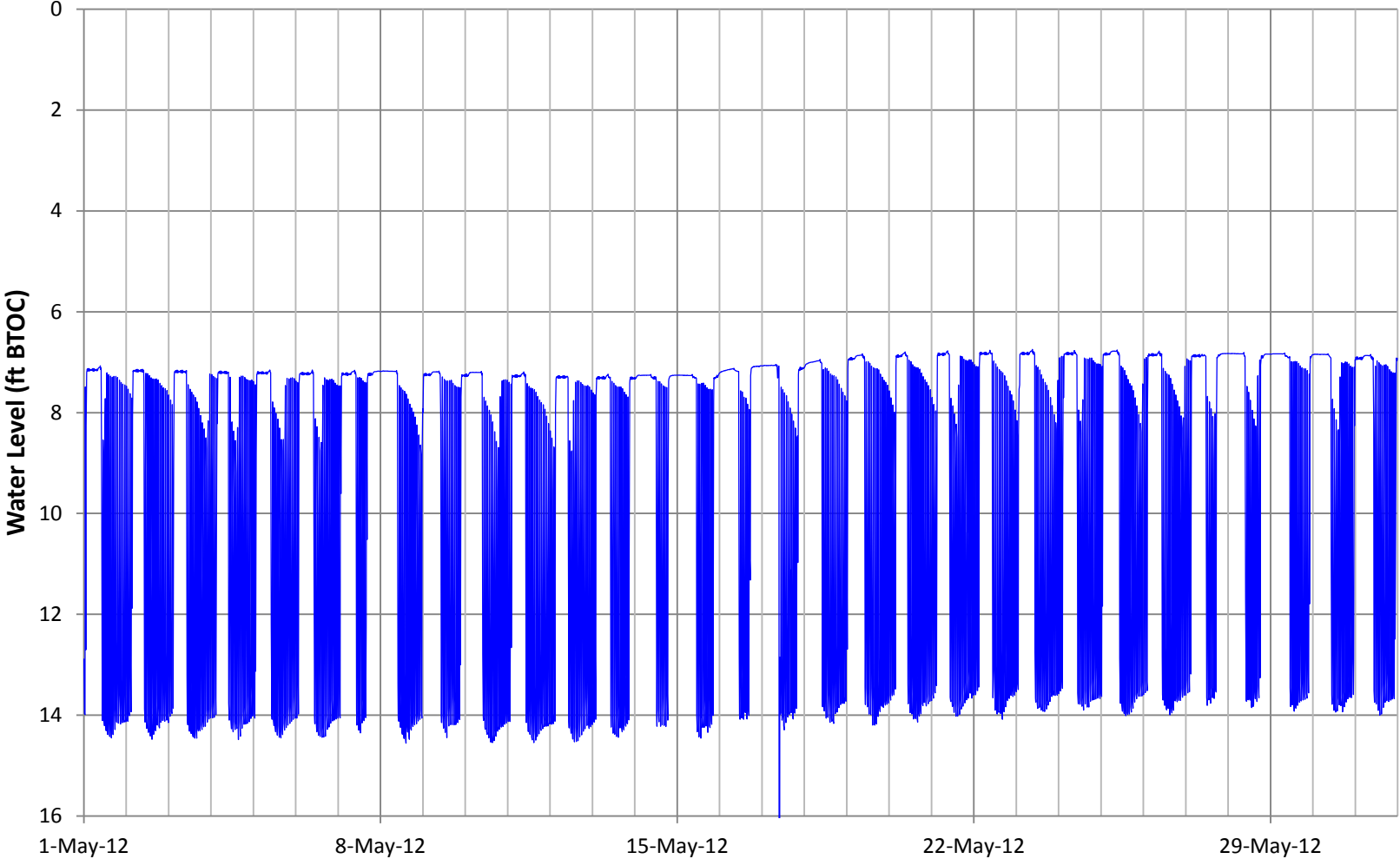


Figure C-4-1J

Water Level in RW0007. Month 11. June 2012

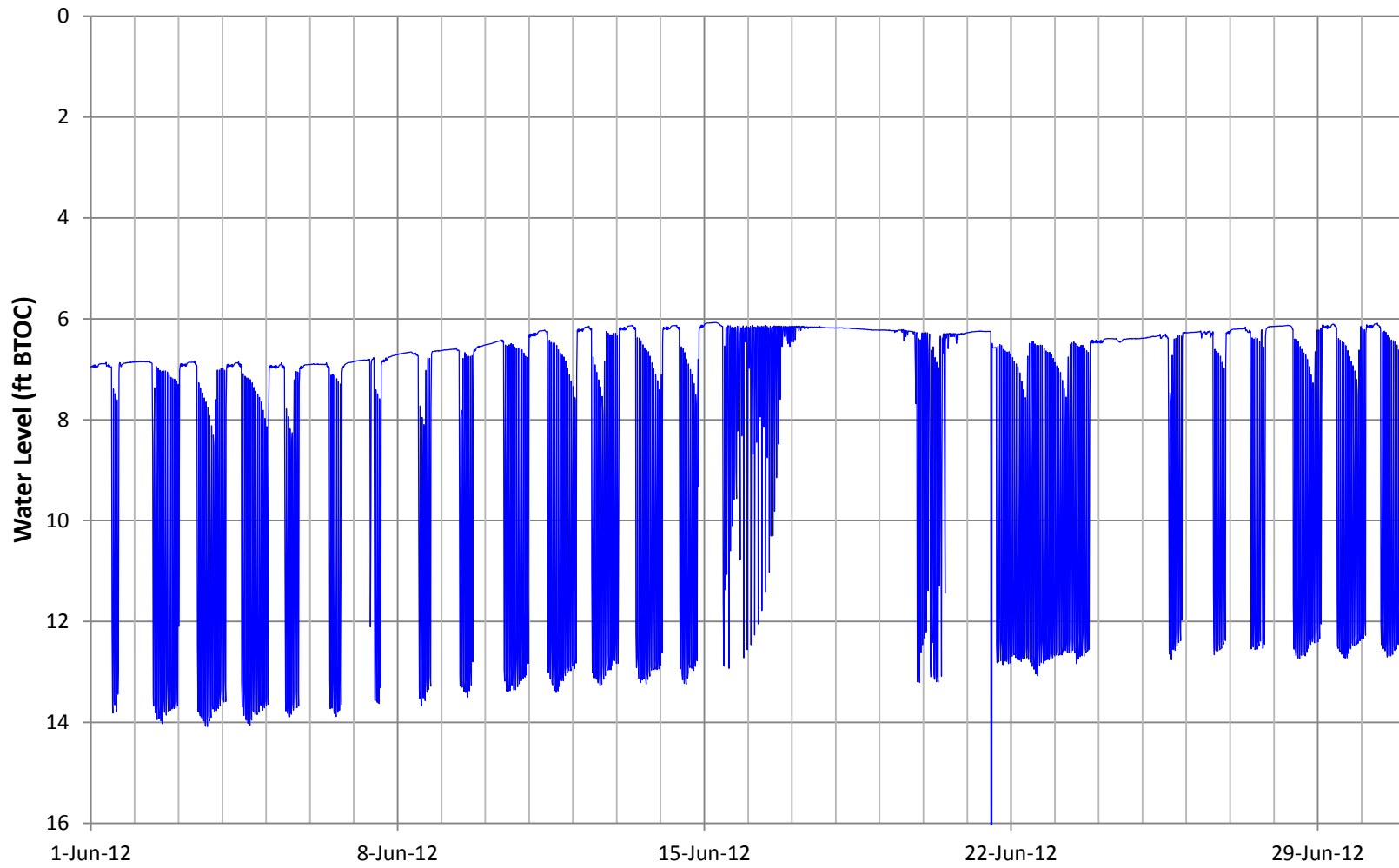


Figure C-4-1K

Water Level in RW0007. Month 12. July 2012

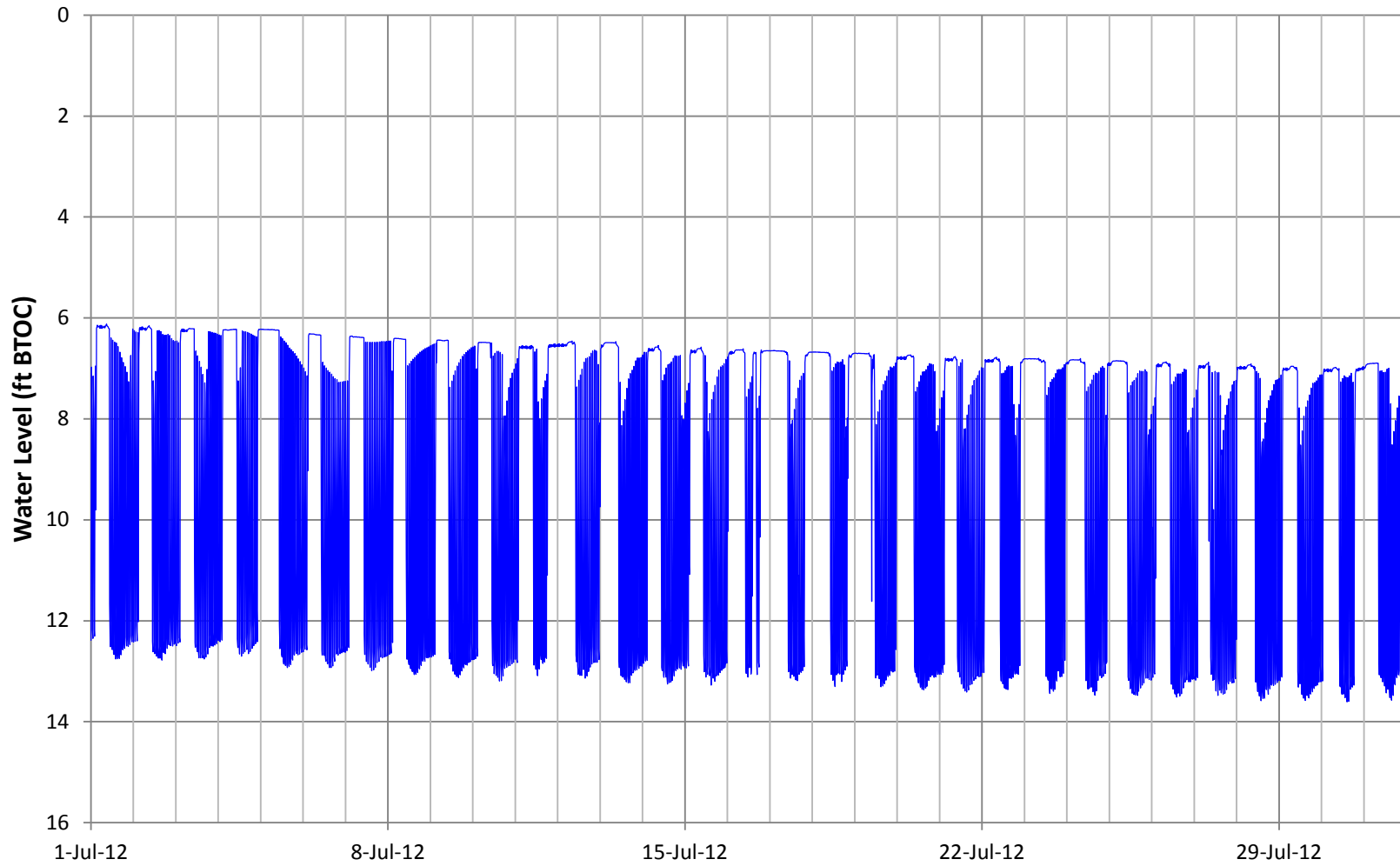


Figure C-4-1L

Water Level in RW0007. Month 13. August 2012

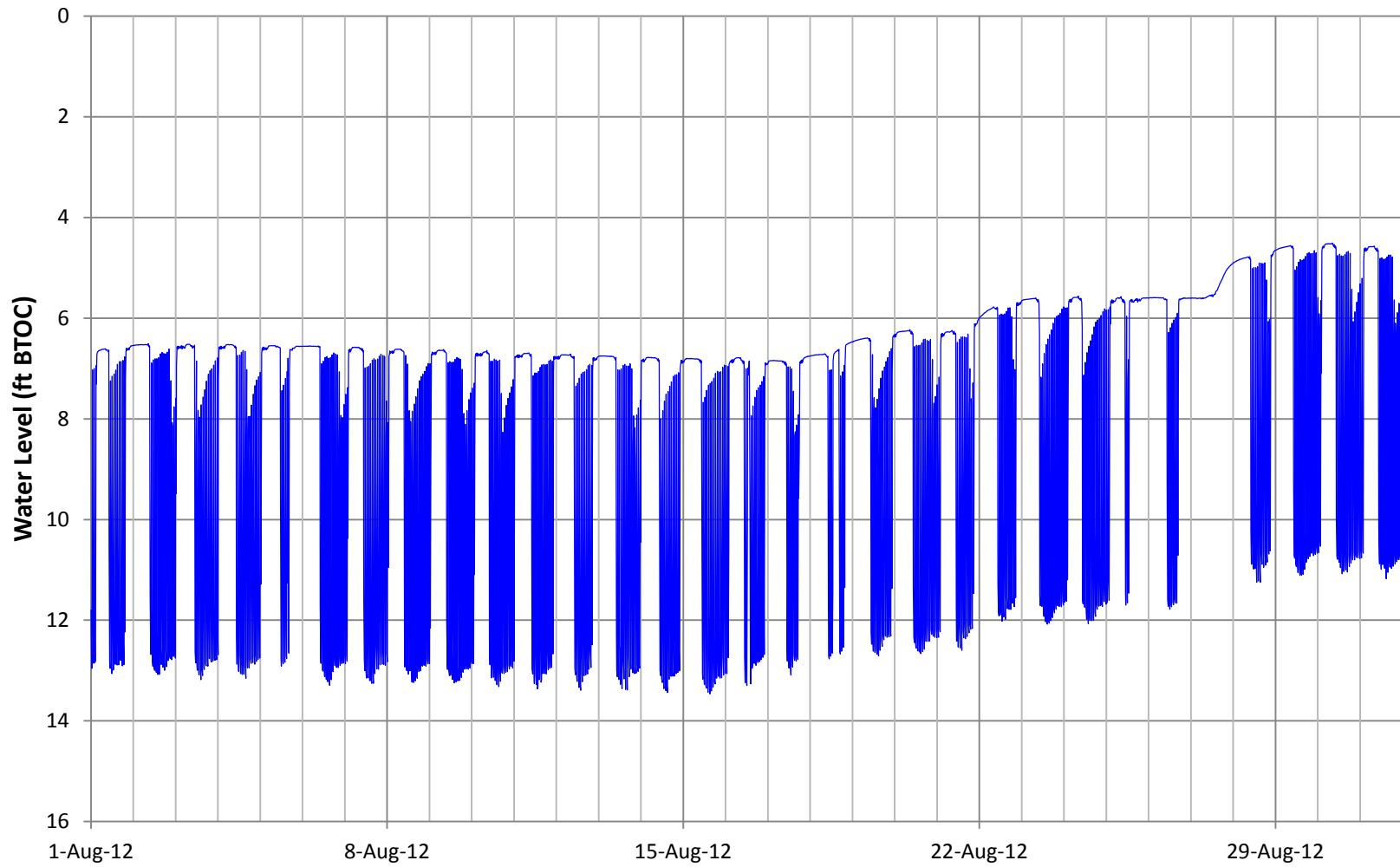


Figure C-4-1M

Water Level in RW0007. Month 14. September 2012

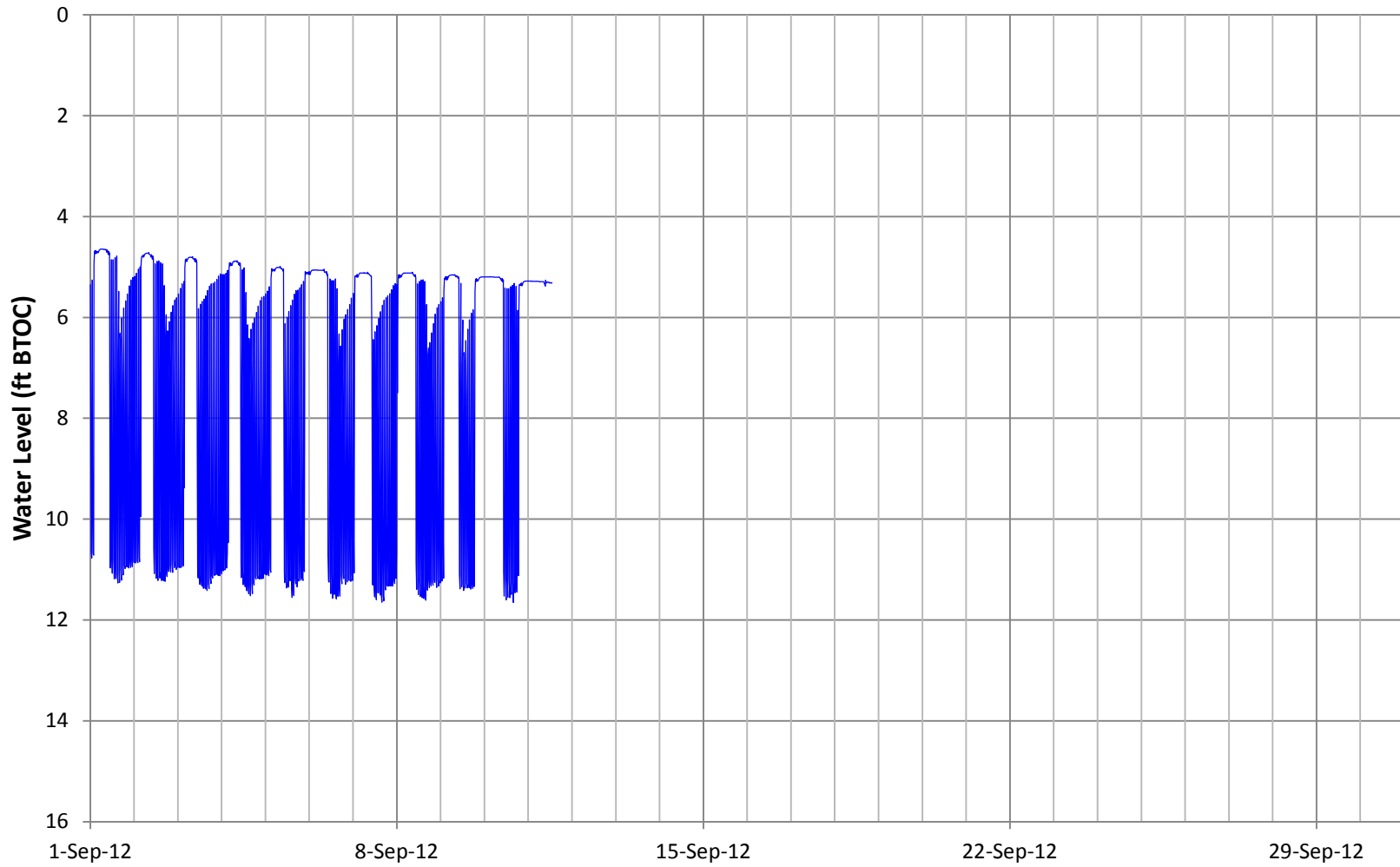


Figure C-4-2A

Water Level in RW0008. Month 2. September 2011

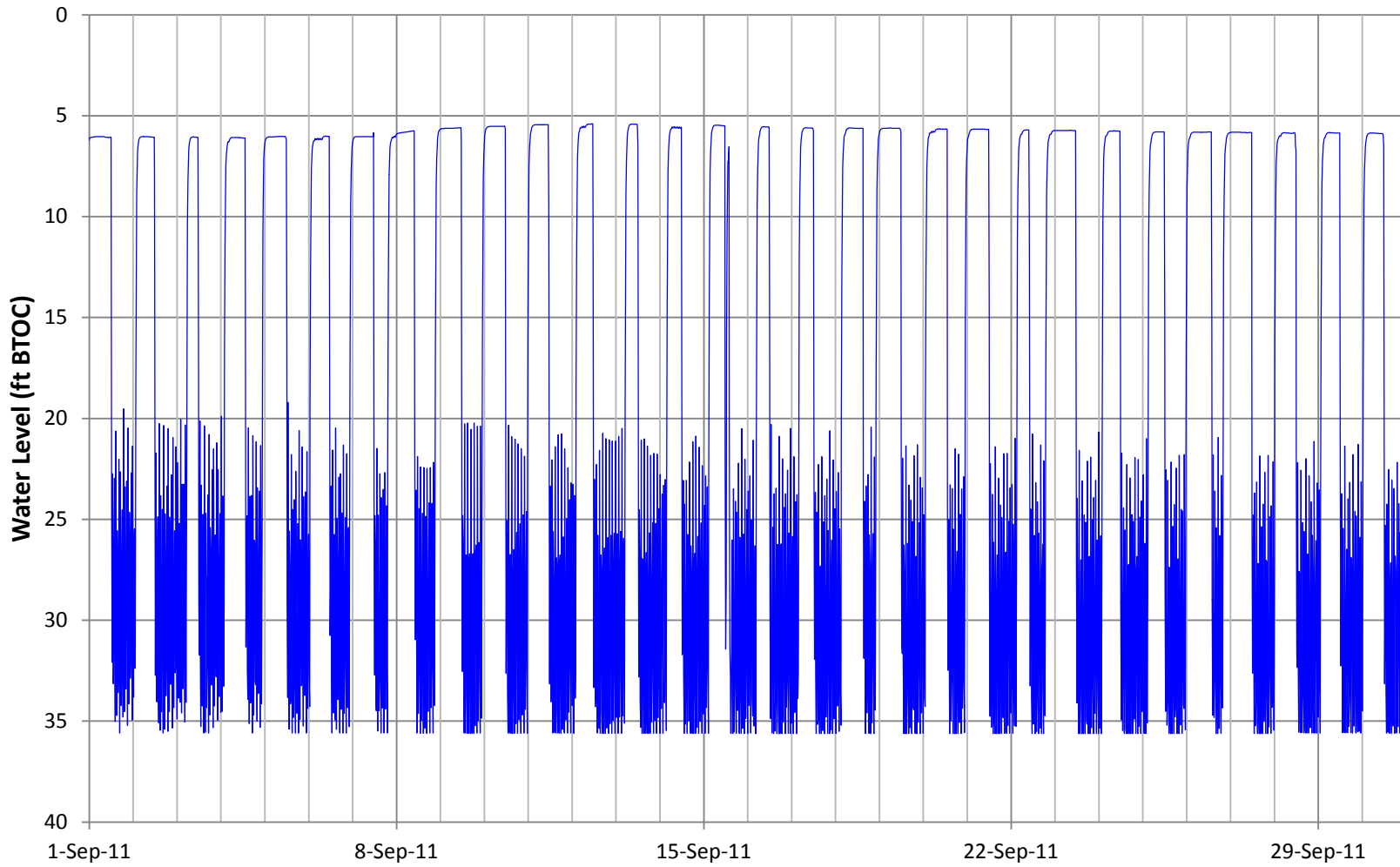


Figure C-4-2B

Water Level in RW0008. Month 3. October 2011

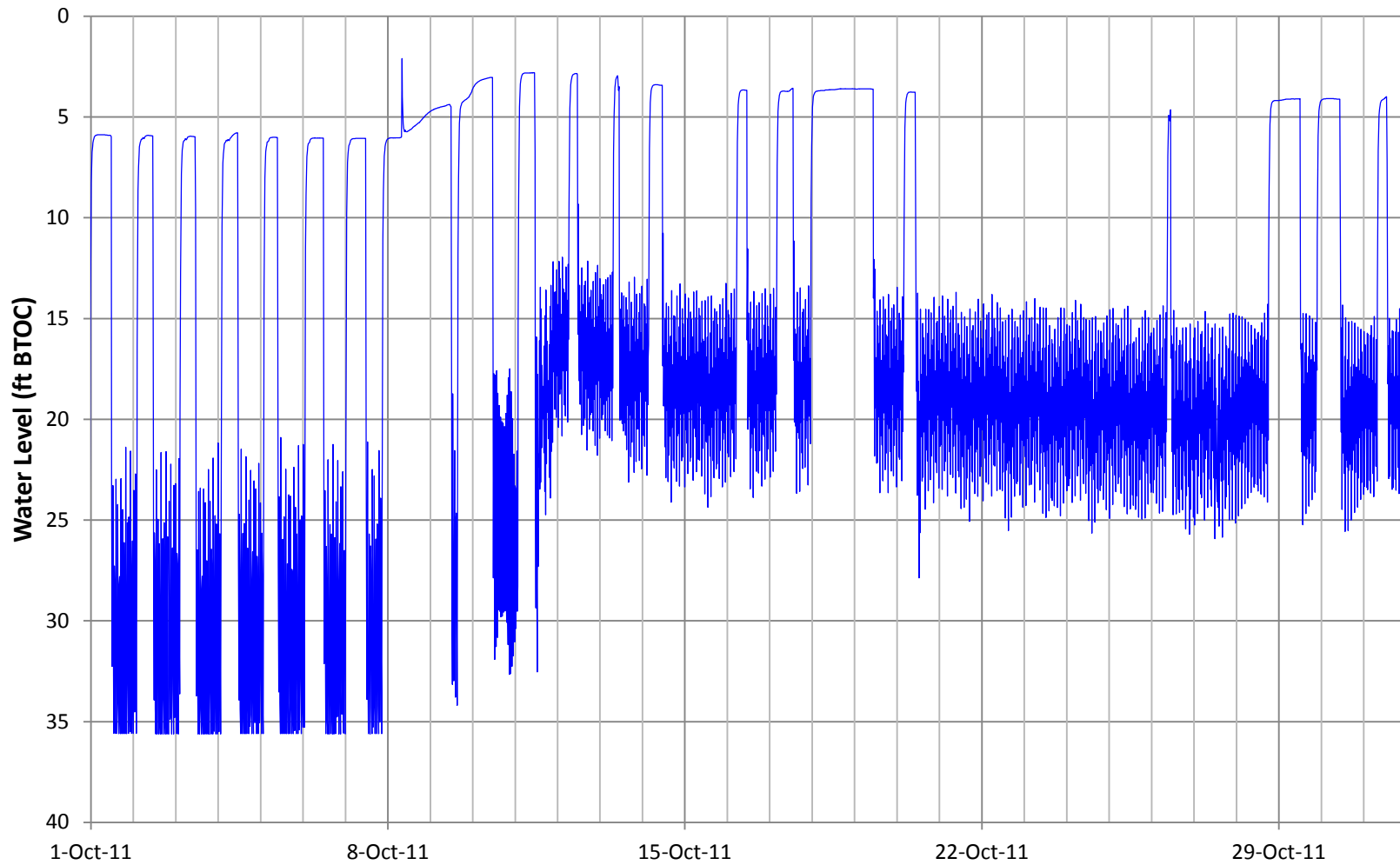


Figure C-4-2C

Water Level in RW0008. Month 4. November 2011

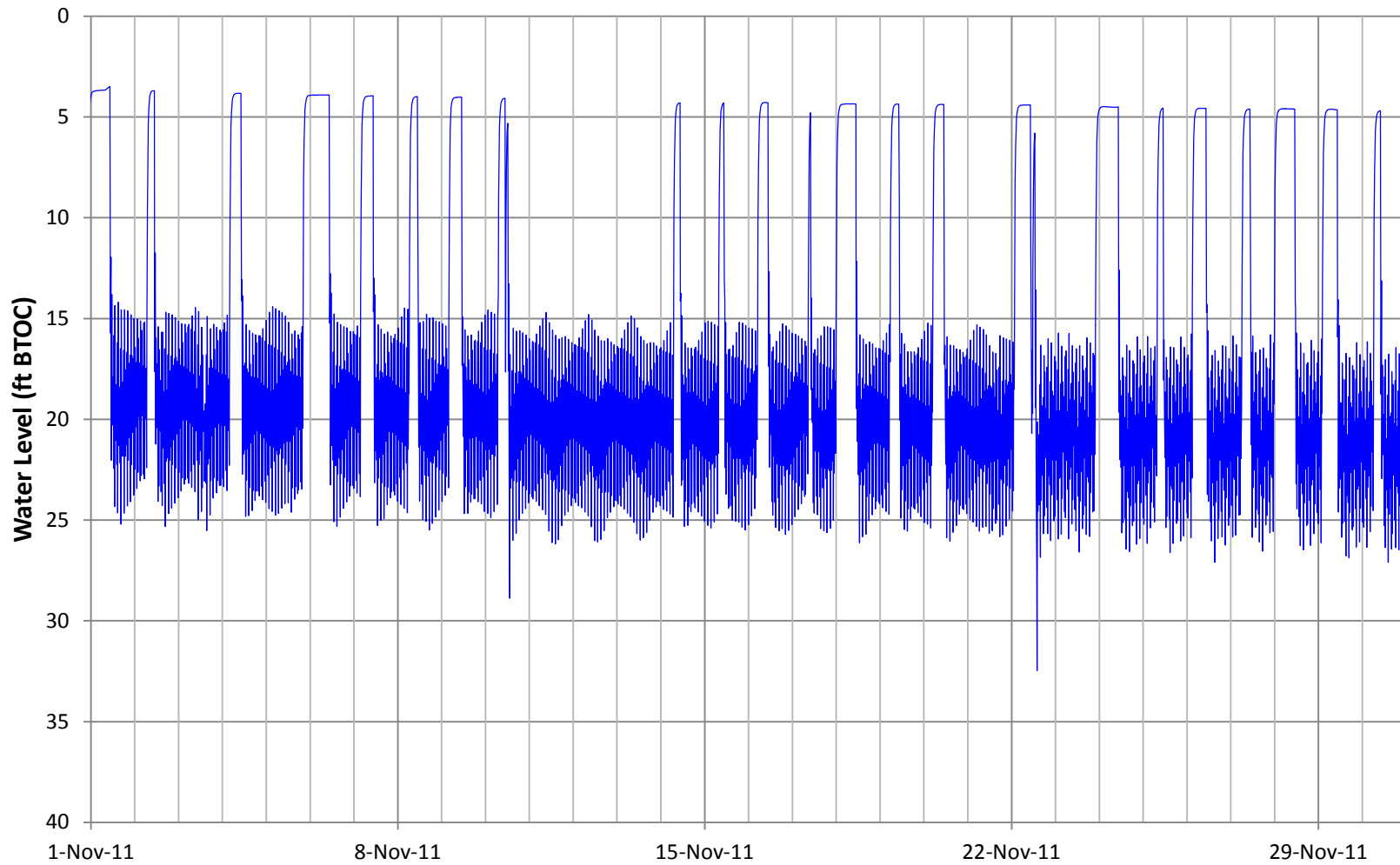


Figure C-4-2D

Water Level in RW0008. Month 5. December 2011

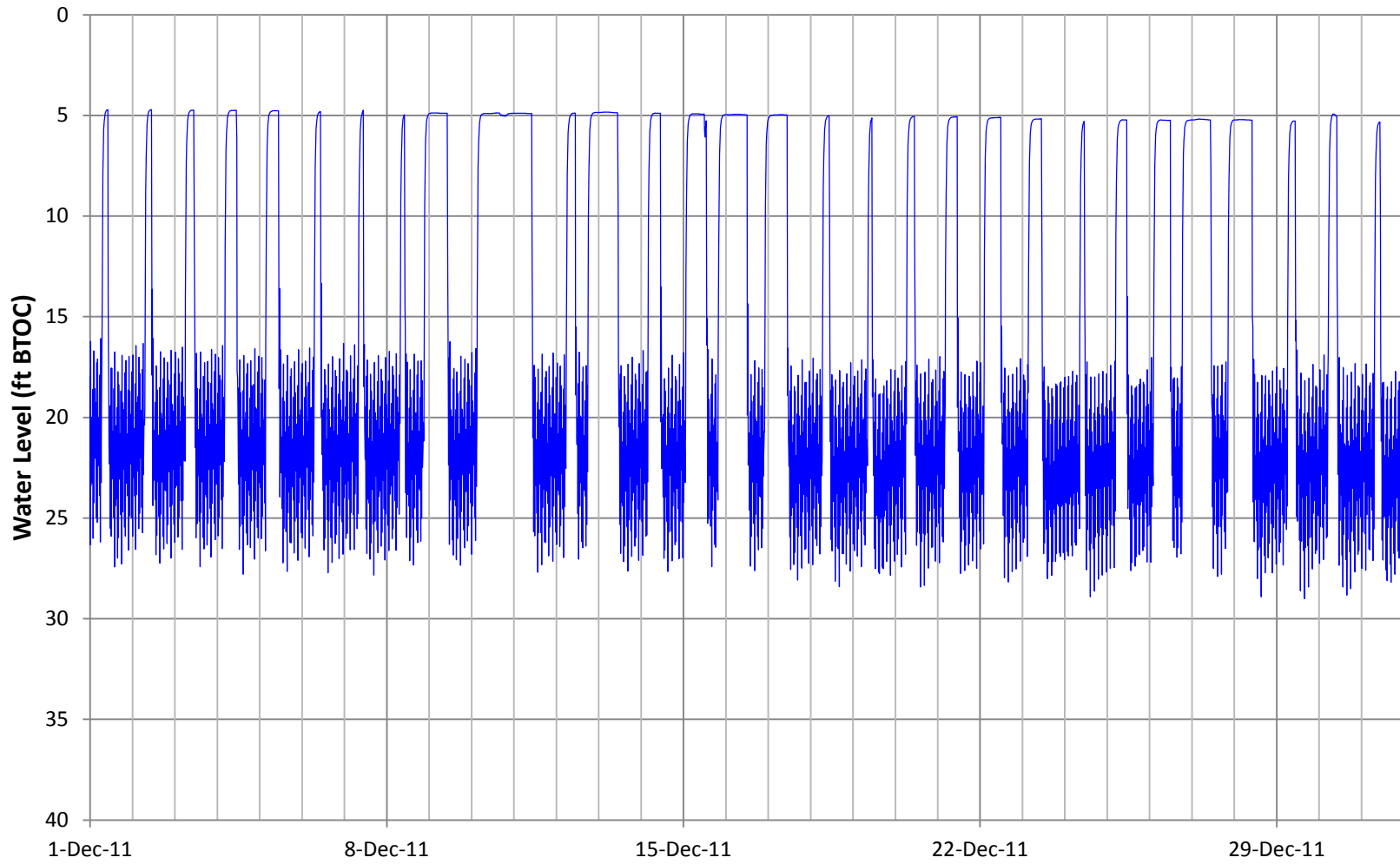


Figure C-4-2E

Water Level in RW0008. Month 6. January 2012

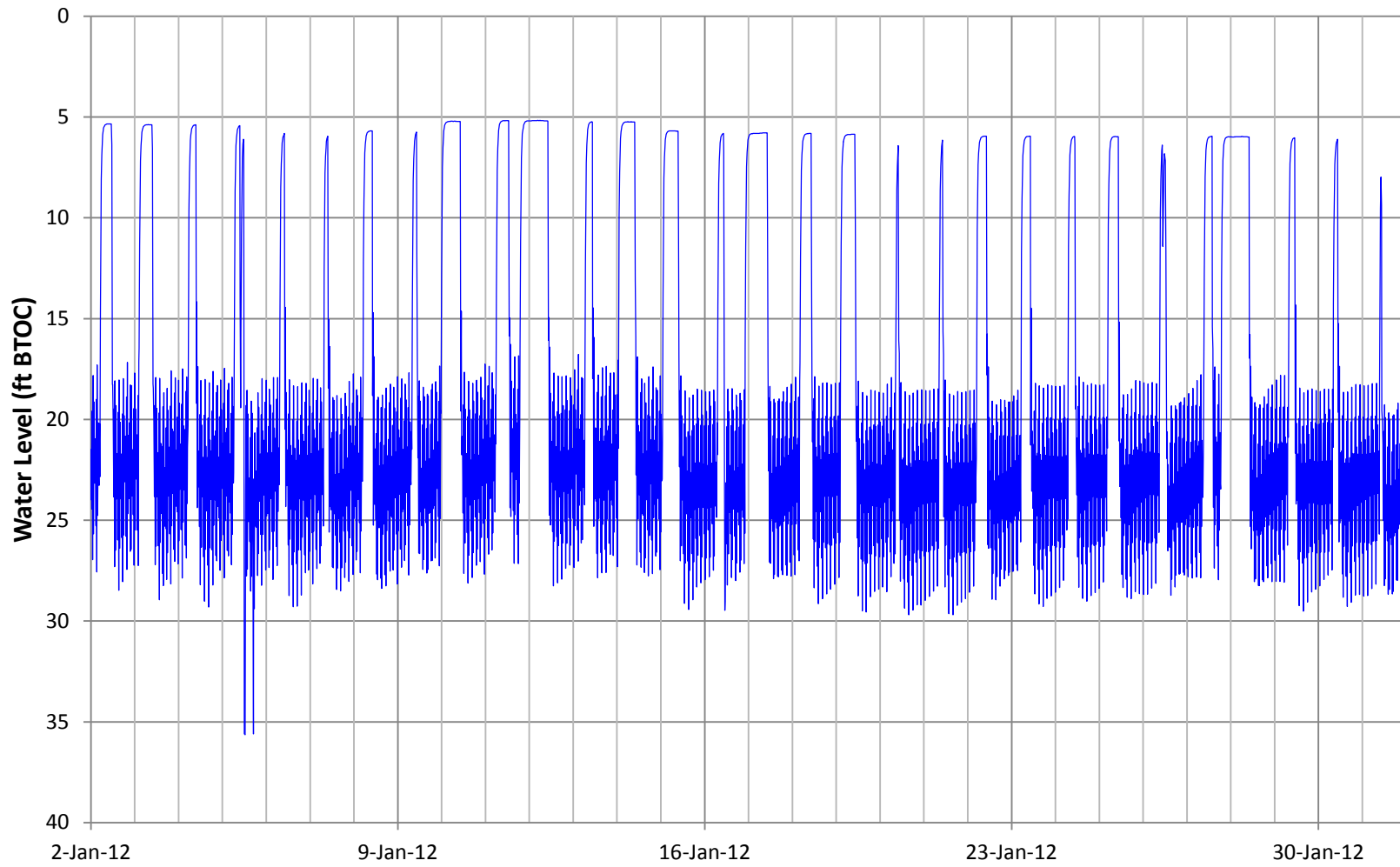


Figure C-4-2F

Water Level in RW0008. Month 7. February 2012

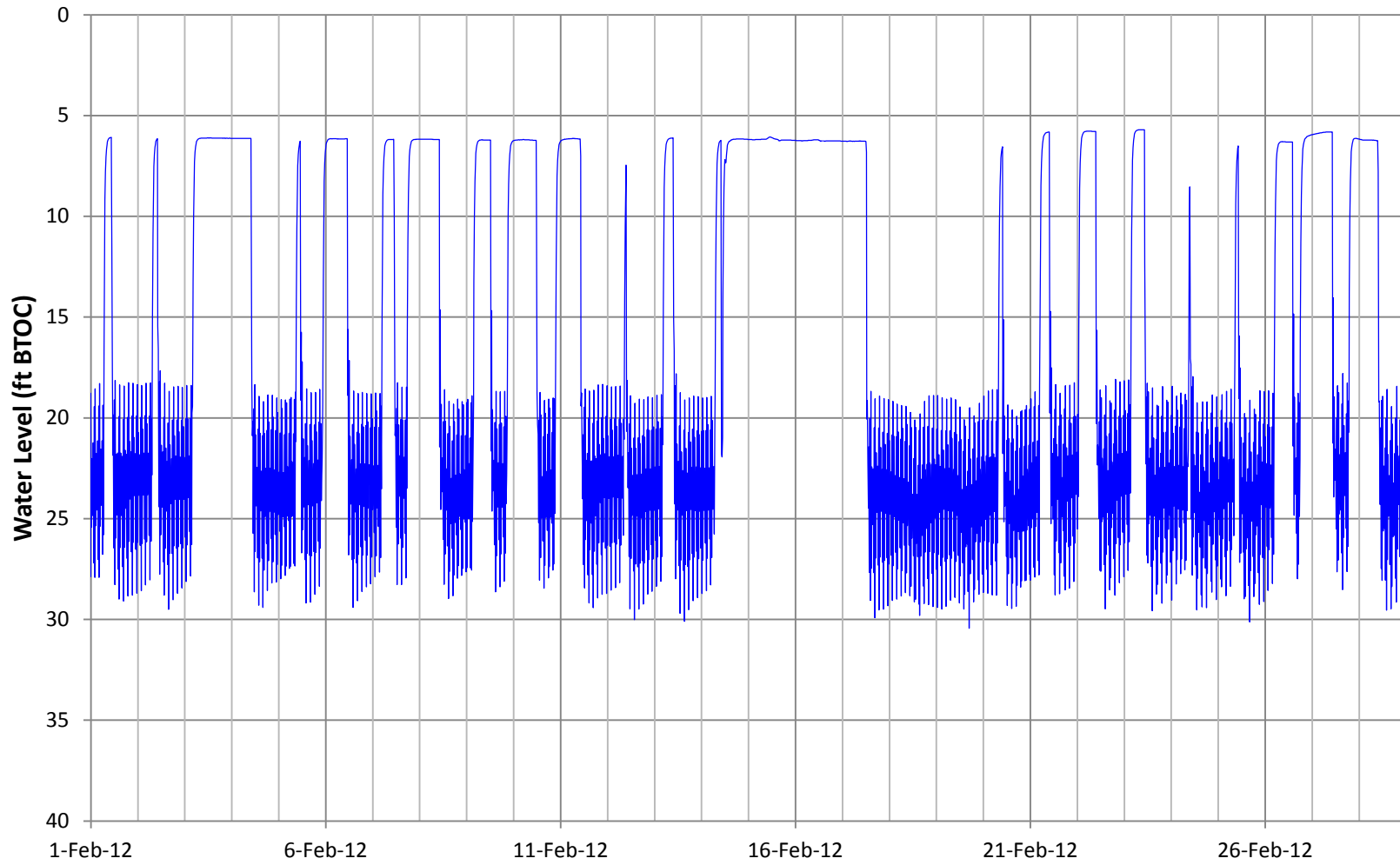


Figure C-4-2G

Water Level in RW0008. Month 8. March 2012

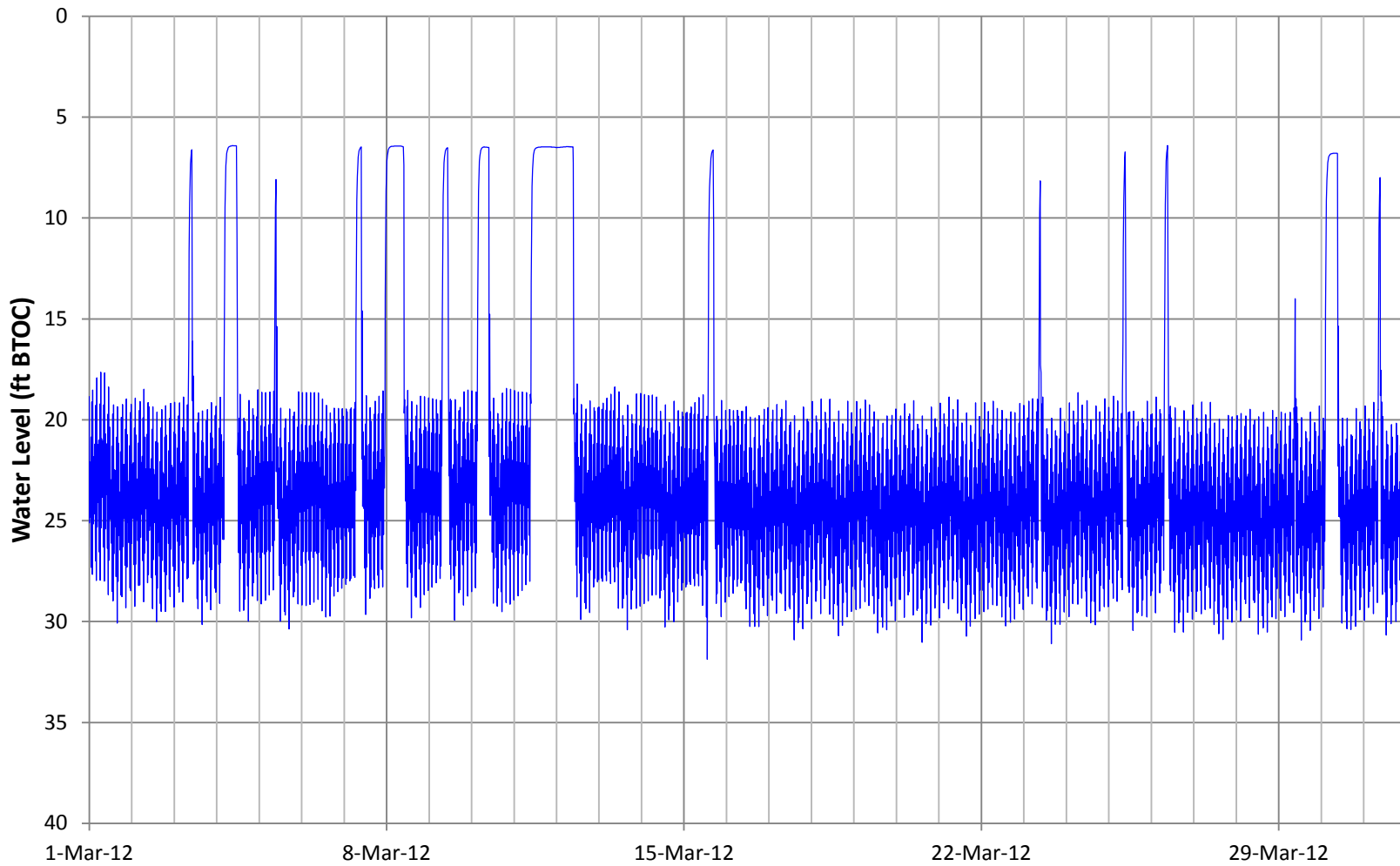


Figure C-4-2H

Water Level in RW0008. Month 9. April 2012

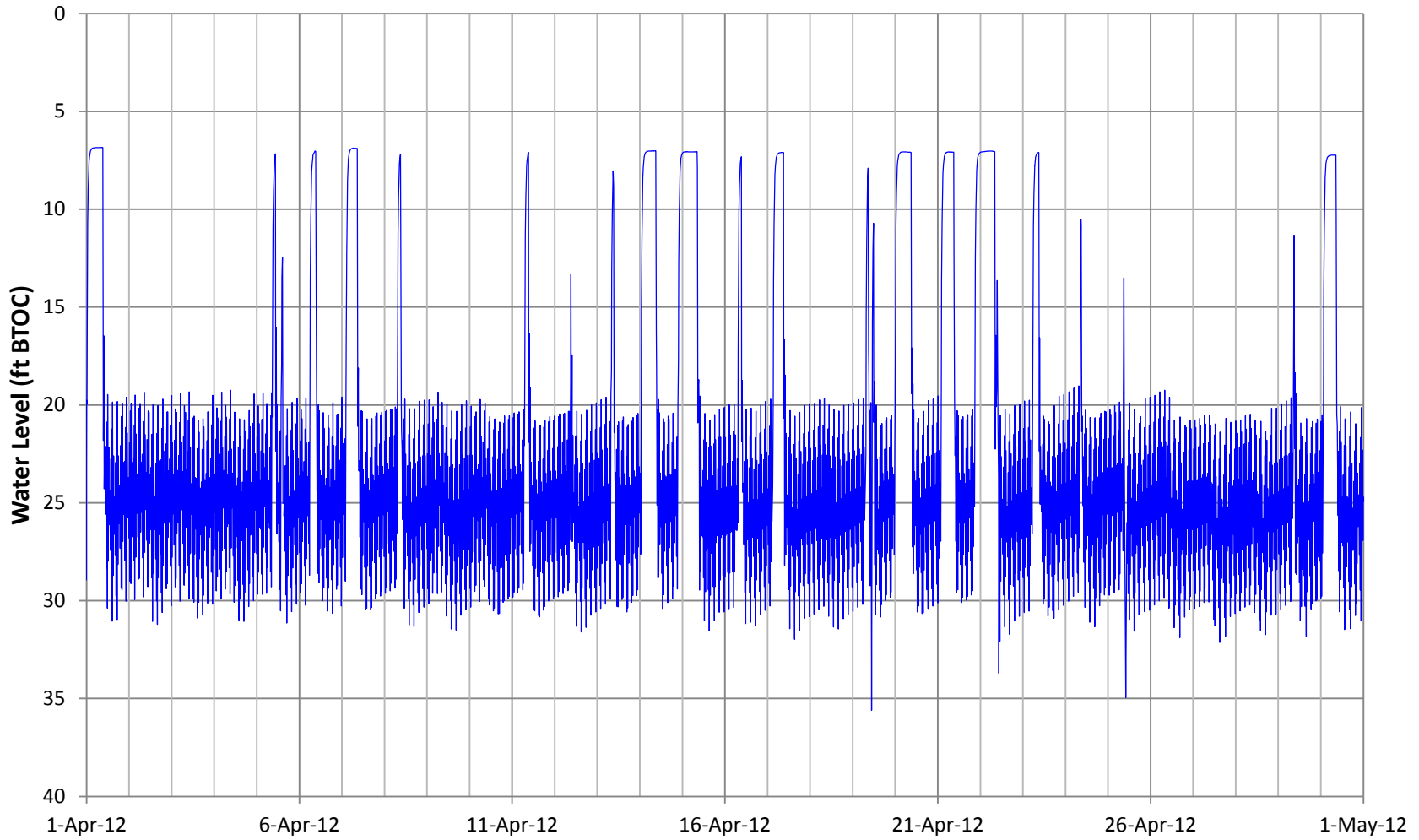


Figure C-4-2I

Water Level in RW0008. Month 10. May 2012

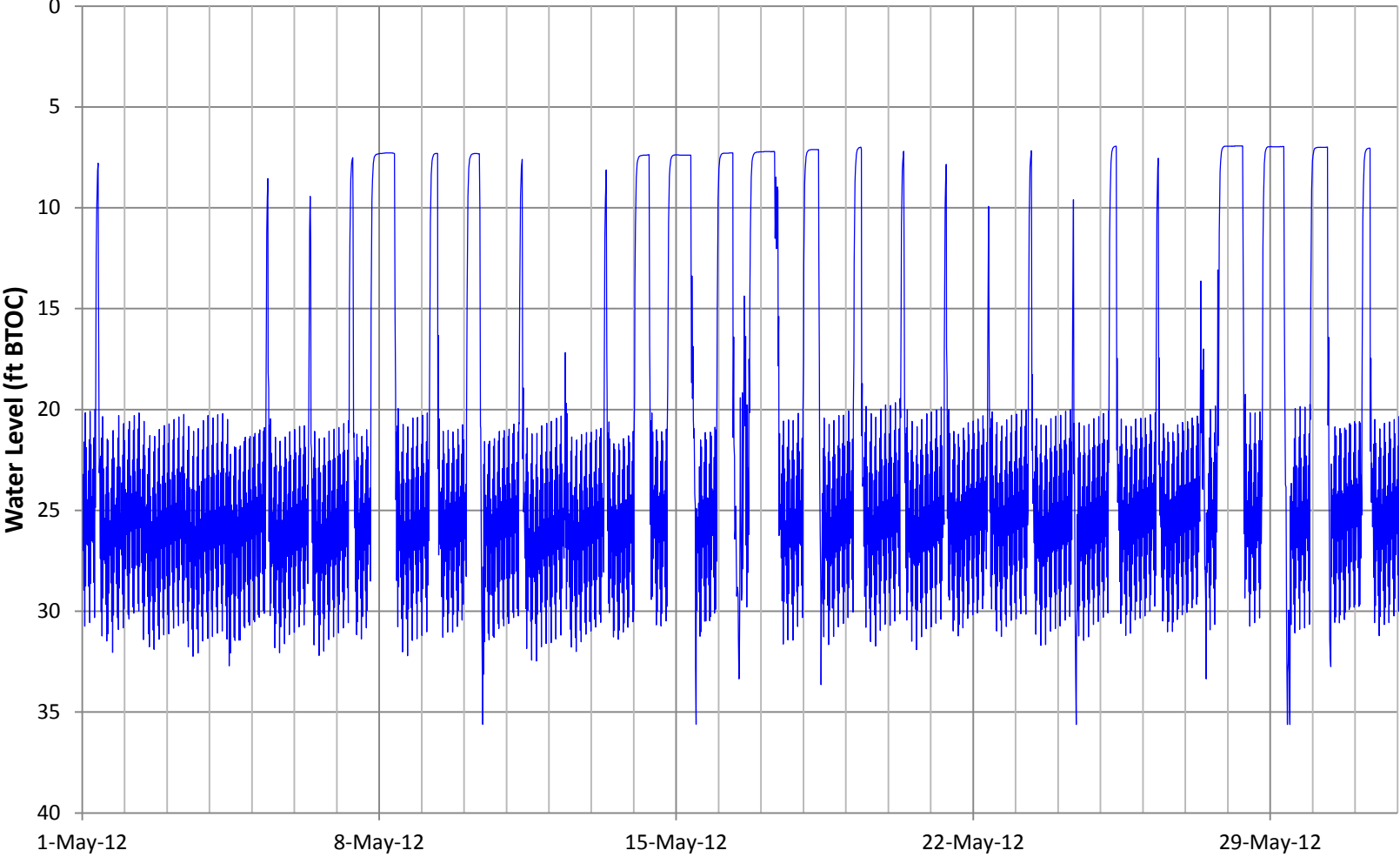


Figure C-4-2J

Water Level in RW0008. Month 11. June 2012

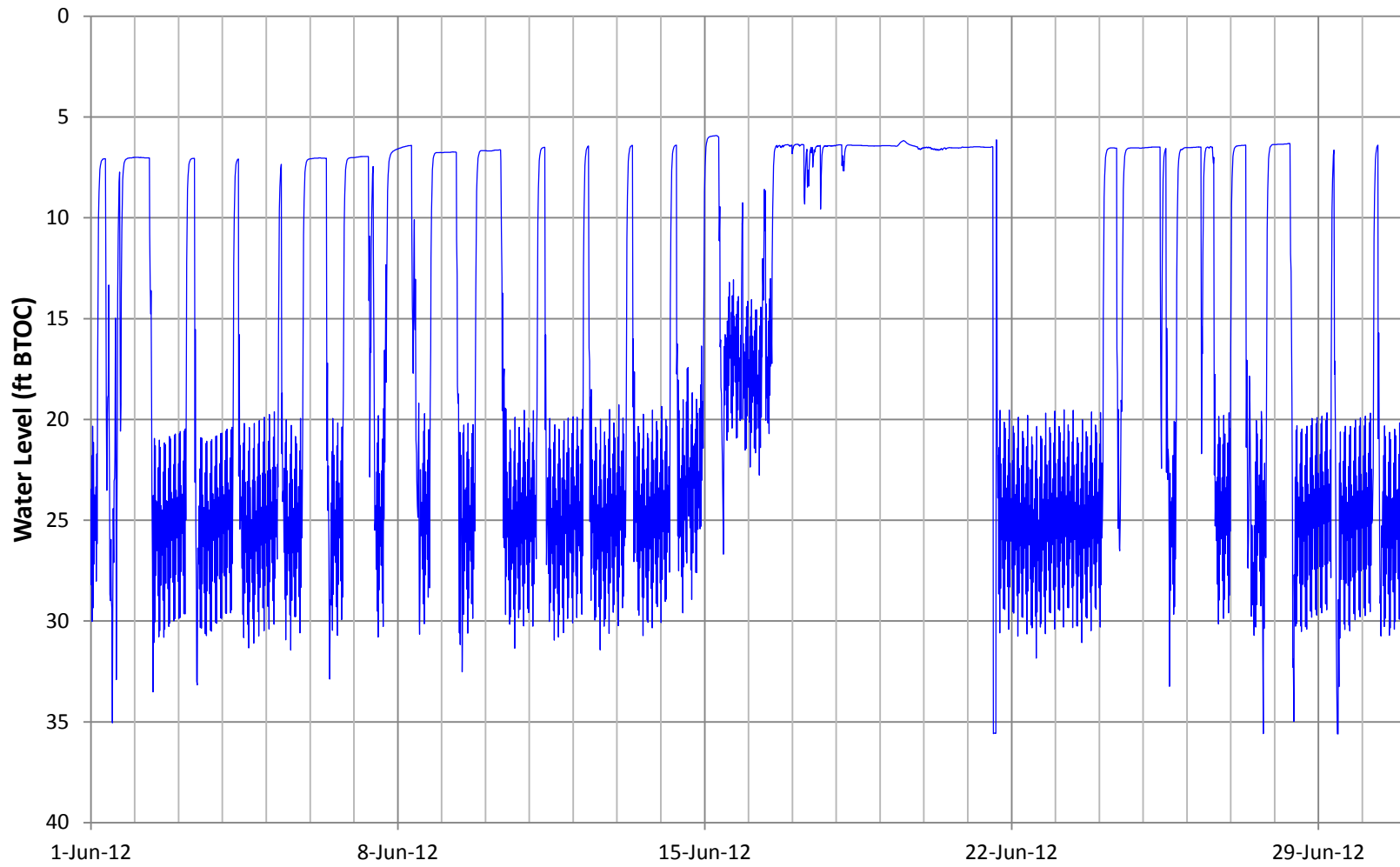


Figure C-4-2K

Water Level in RW0008. Month 12. July 2012

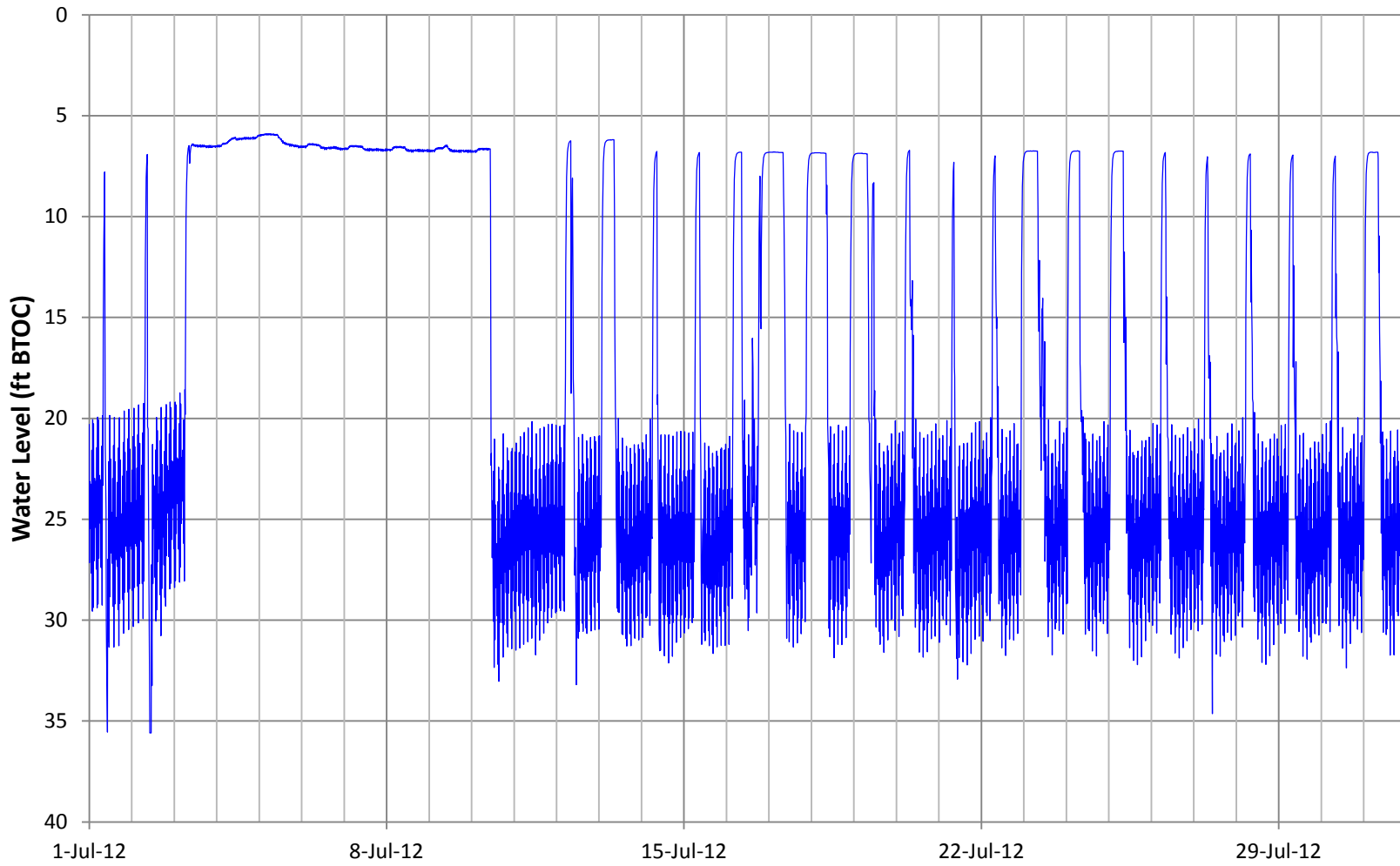


Figure C-4-2L

Water Level in RW0008. Month 13. August 2012

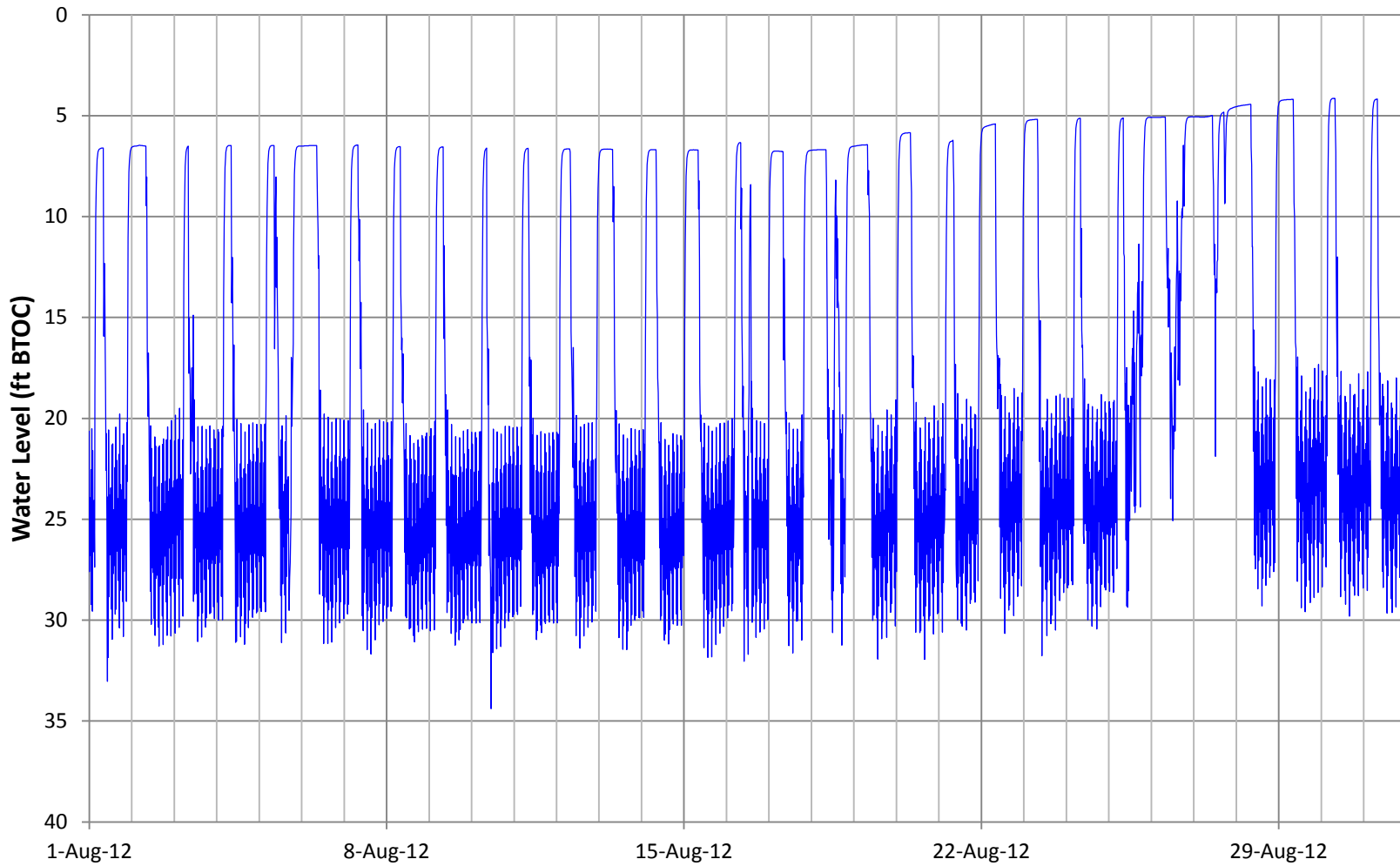


Figure C-4-2M

Water Level in RW0008. Month 14. September 2012

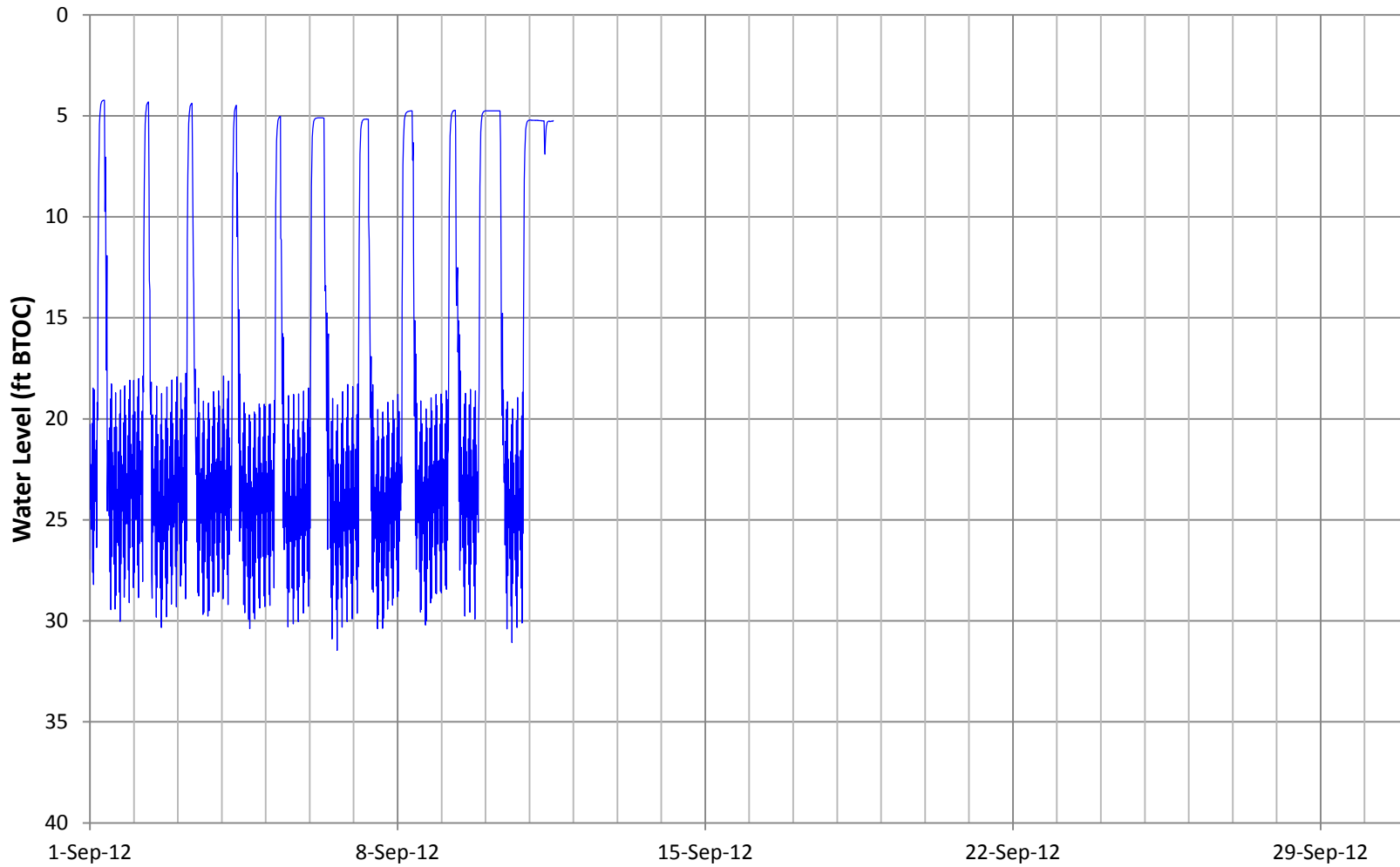


Figure C-4-3A

Water Level in IW0002D. Month 1. August 2011

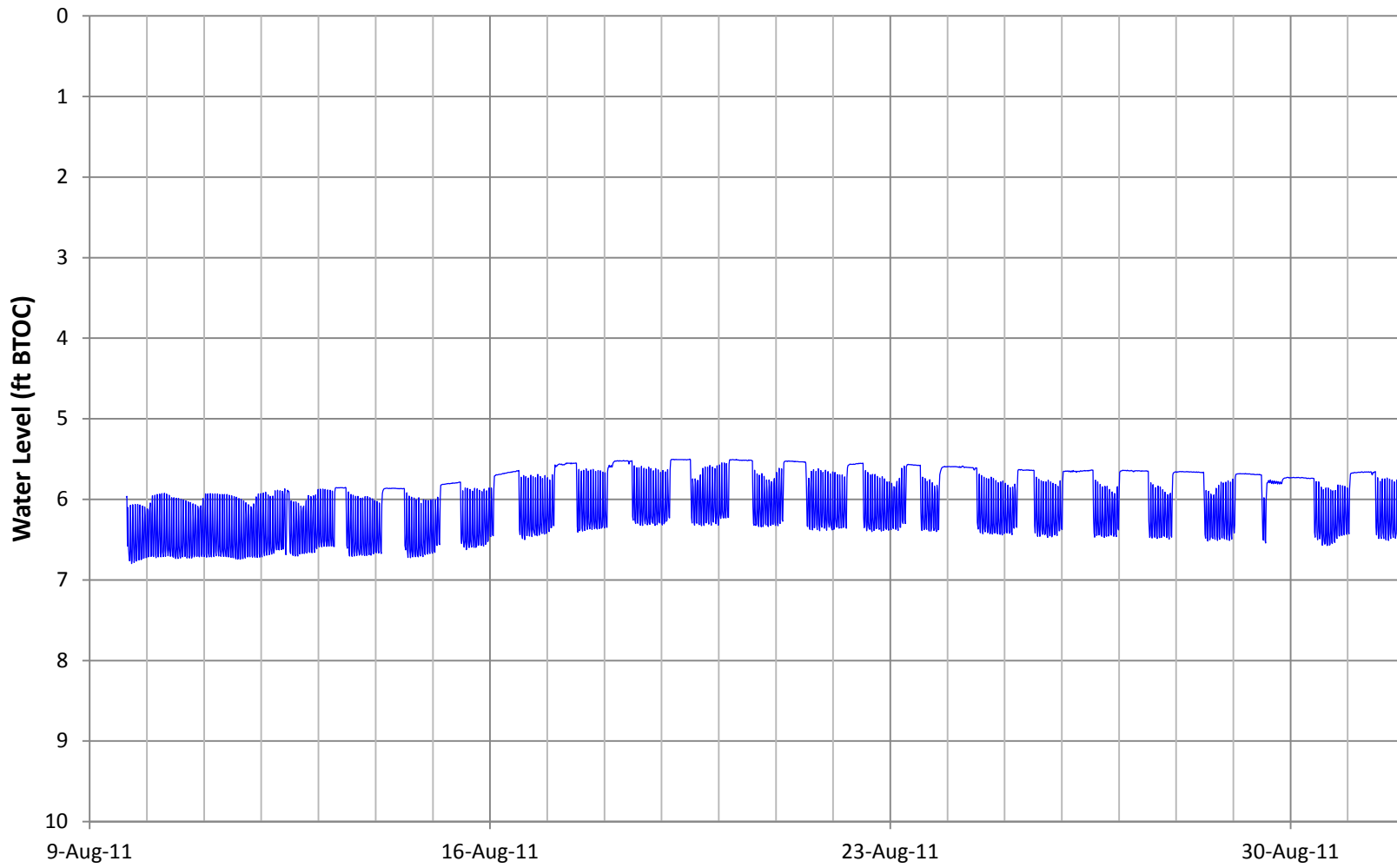


Figure C-4-3B

Water Level in IW0002D. Month 2. September 2011

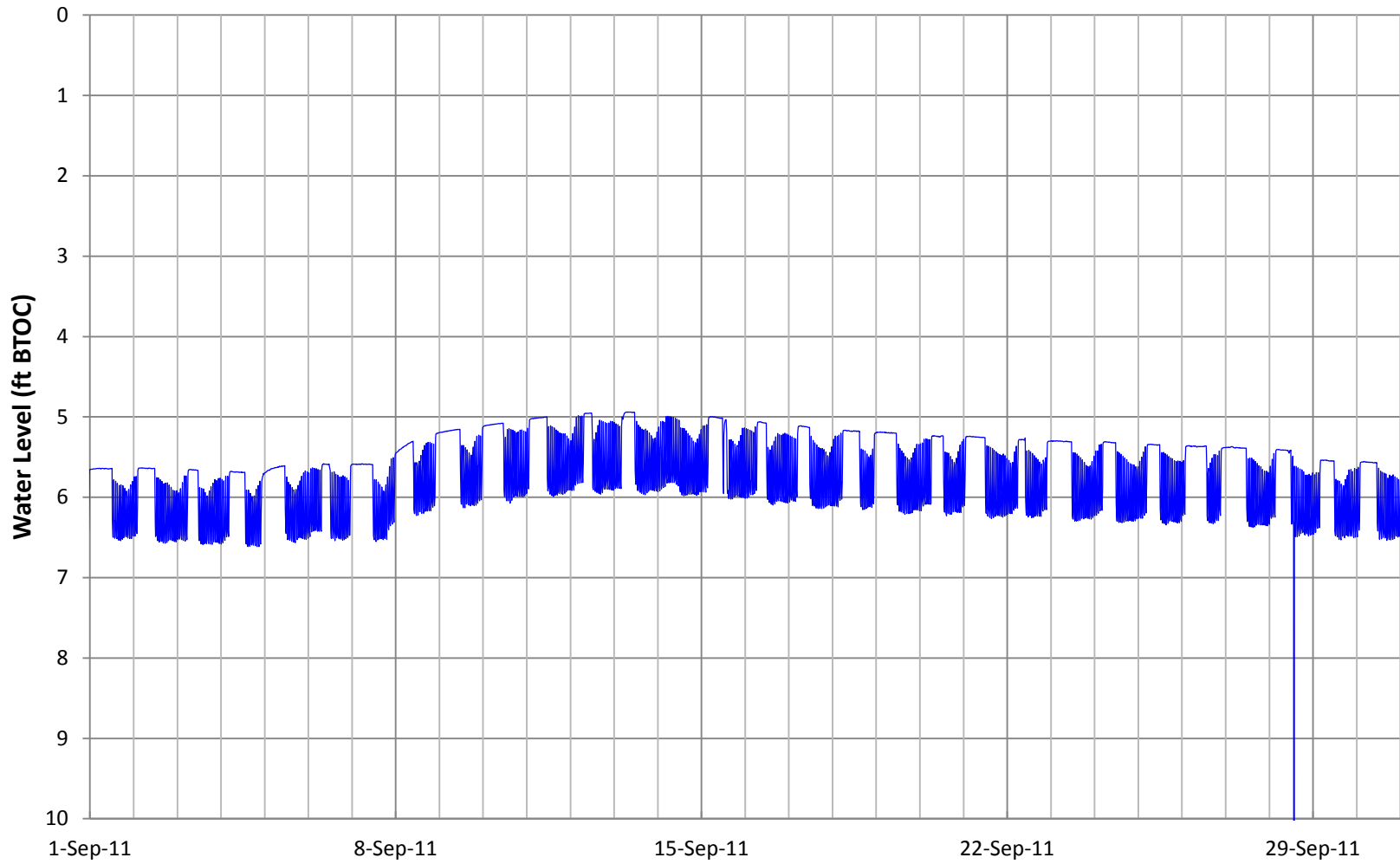


Figure C-4-3C

Water Level in IW0002D. Month 3. October 2011

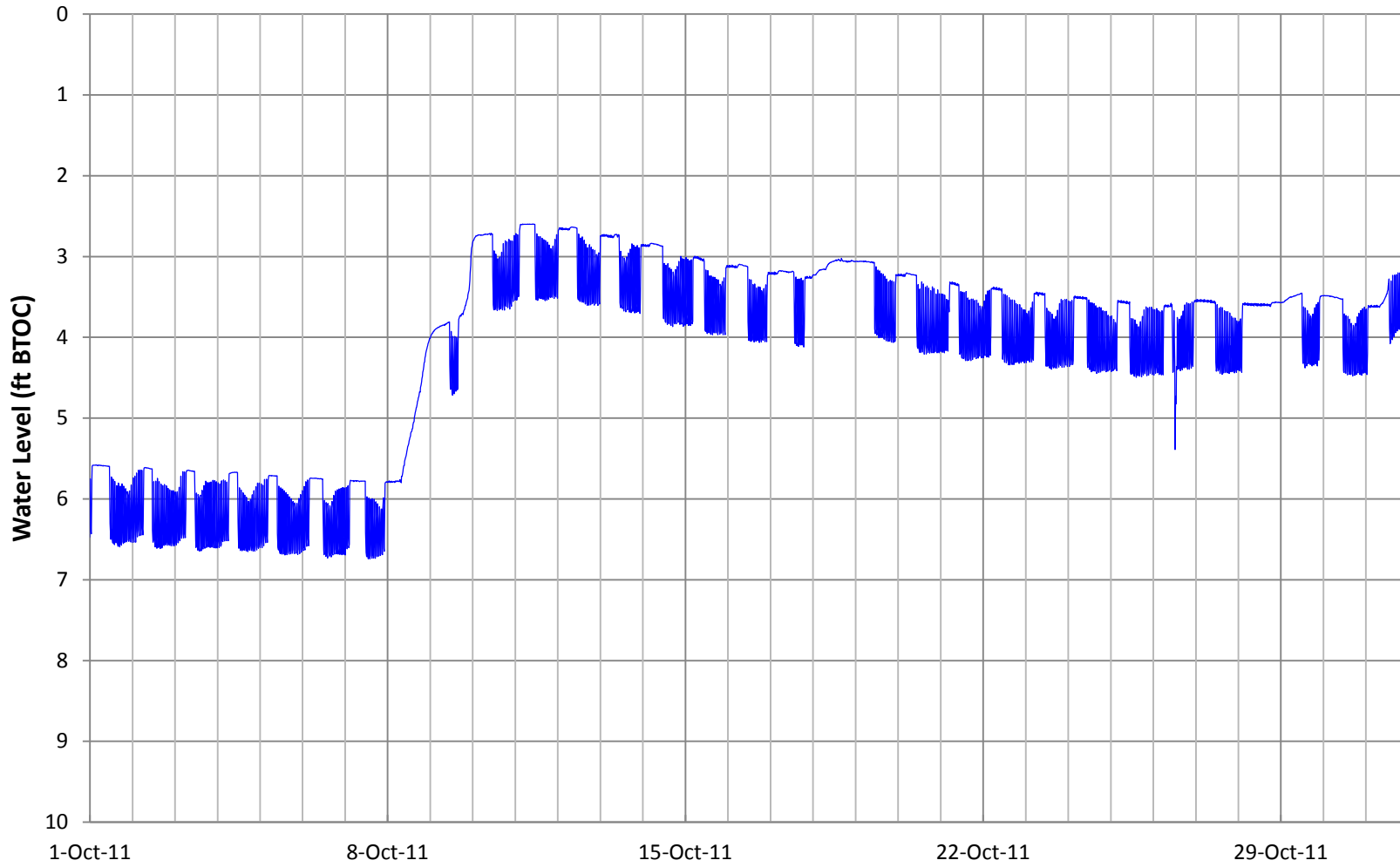


Figure C-4-3D

Water Level in IW0002D. Month 4. November 2011

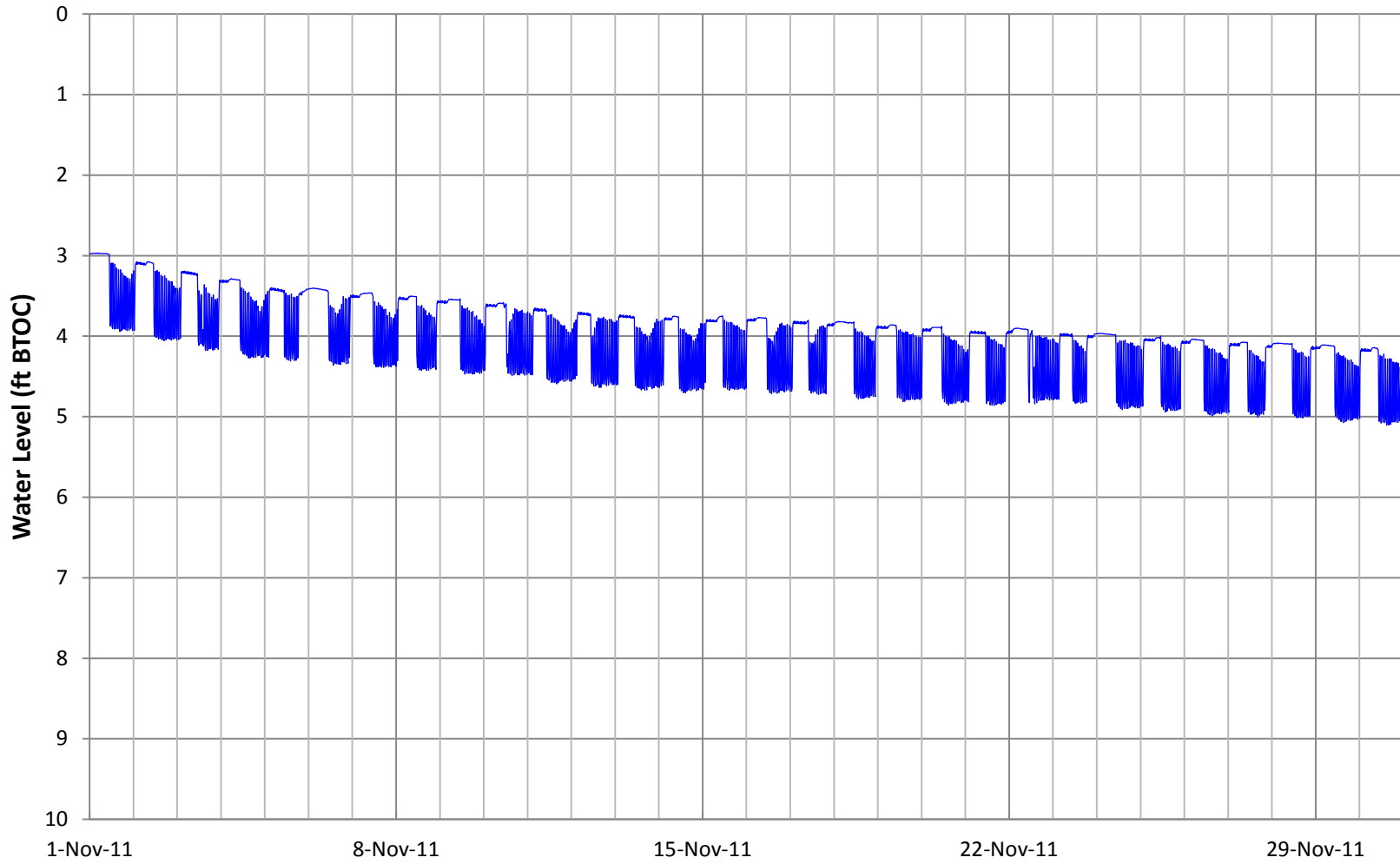


Figure C-4-3E

Water Level in IW0002D. Month 5. December 2011

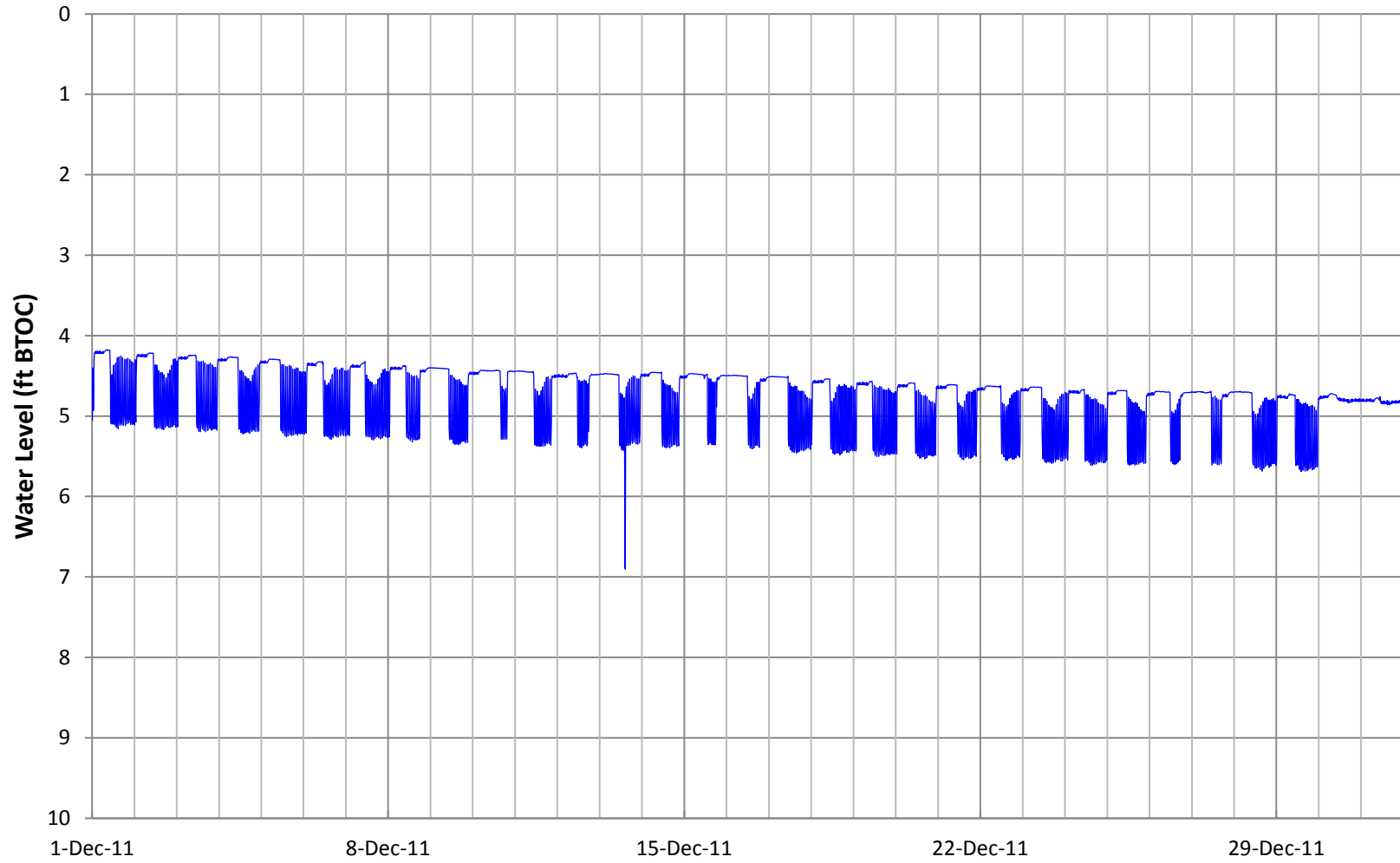


Figure C-4-3F

Water Level in IW0002D. Month 6. January 2012

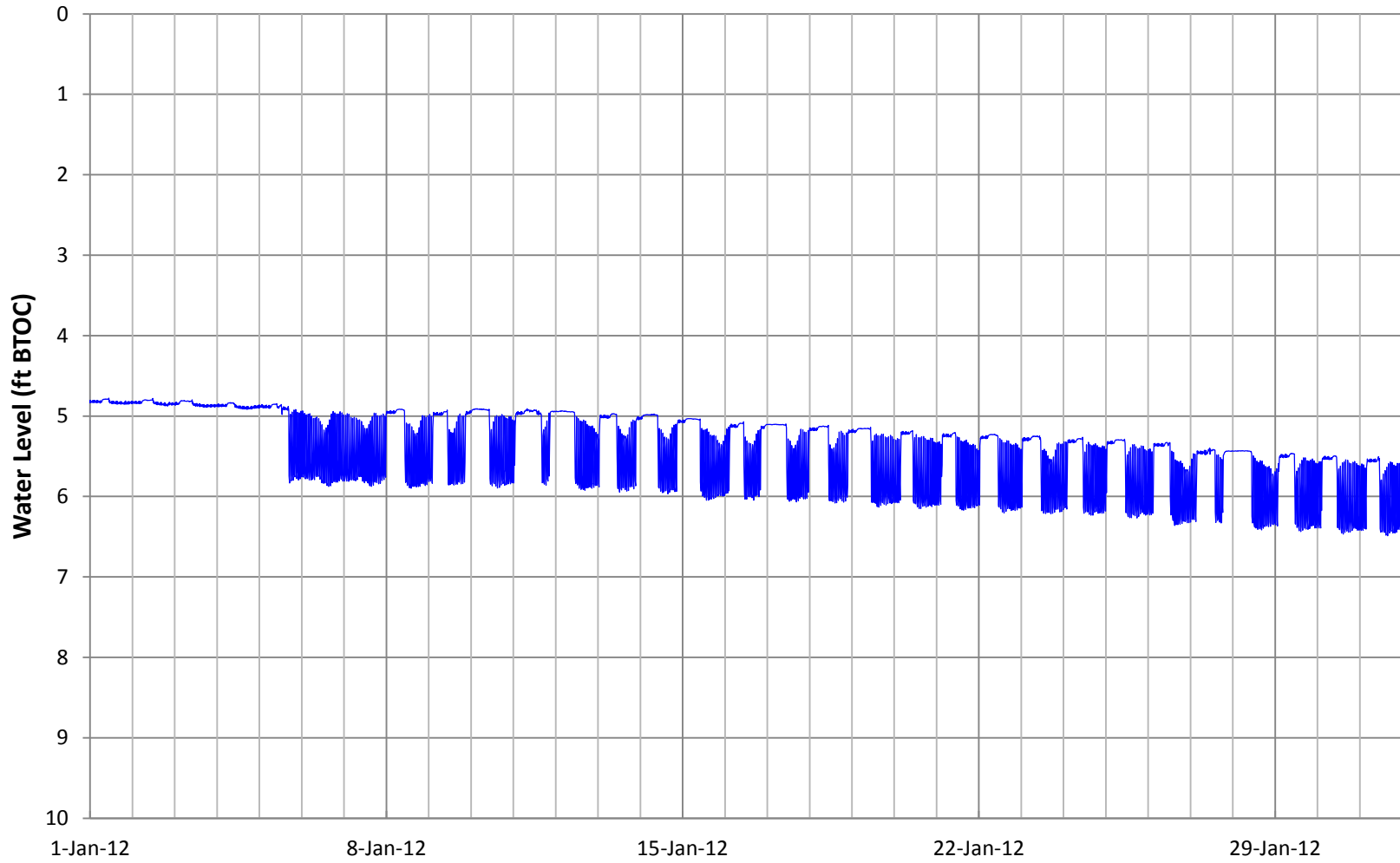


Figure C-4-3G

Water Level in IW0002D. Month 7. February 2012

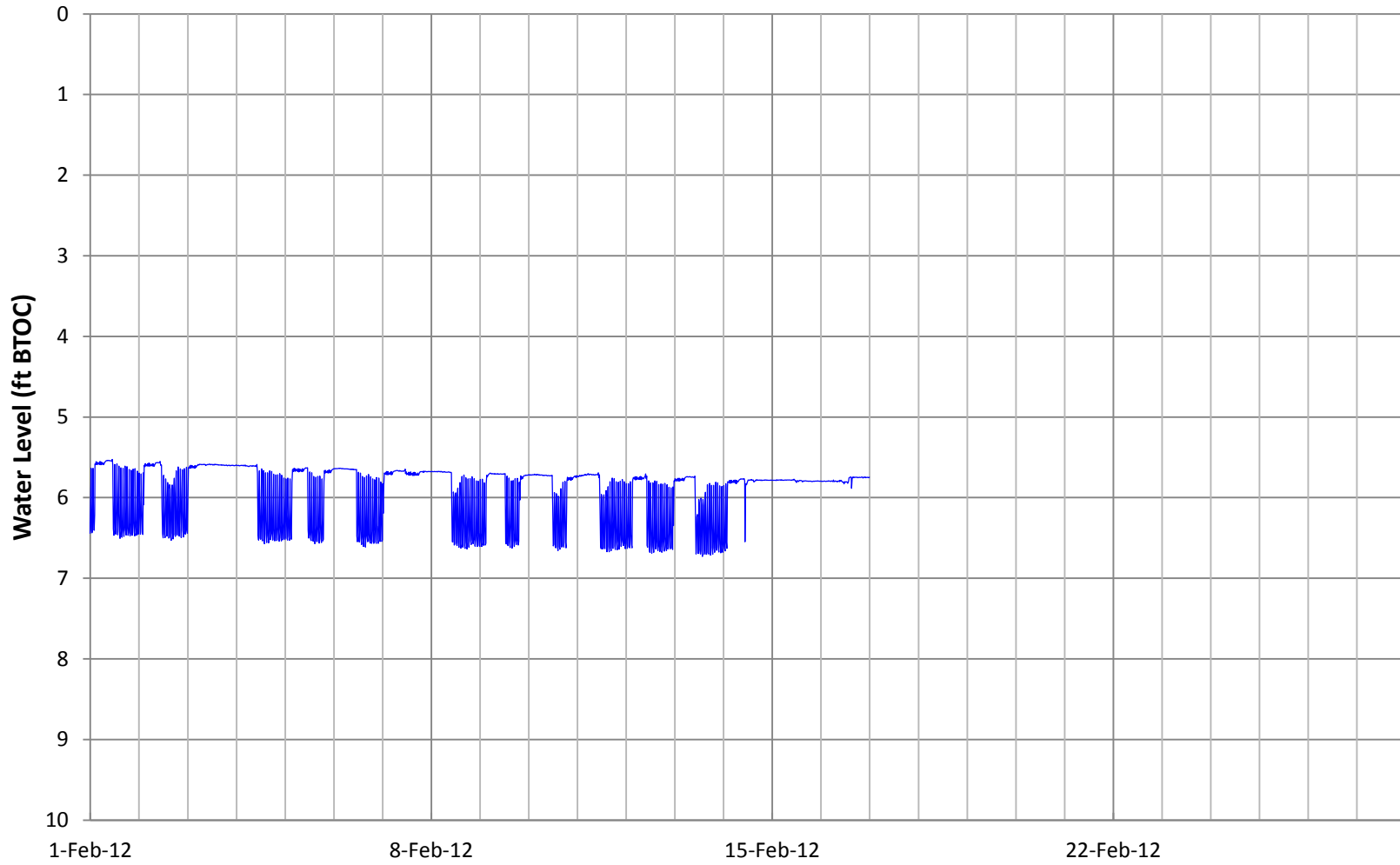


Figure C-4-4A

Water Level in IW0002D1. Month 1. August 2011

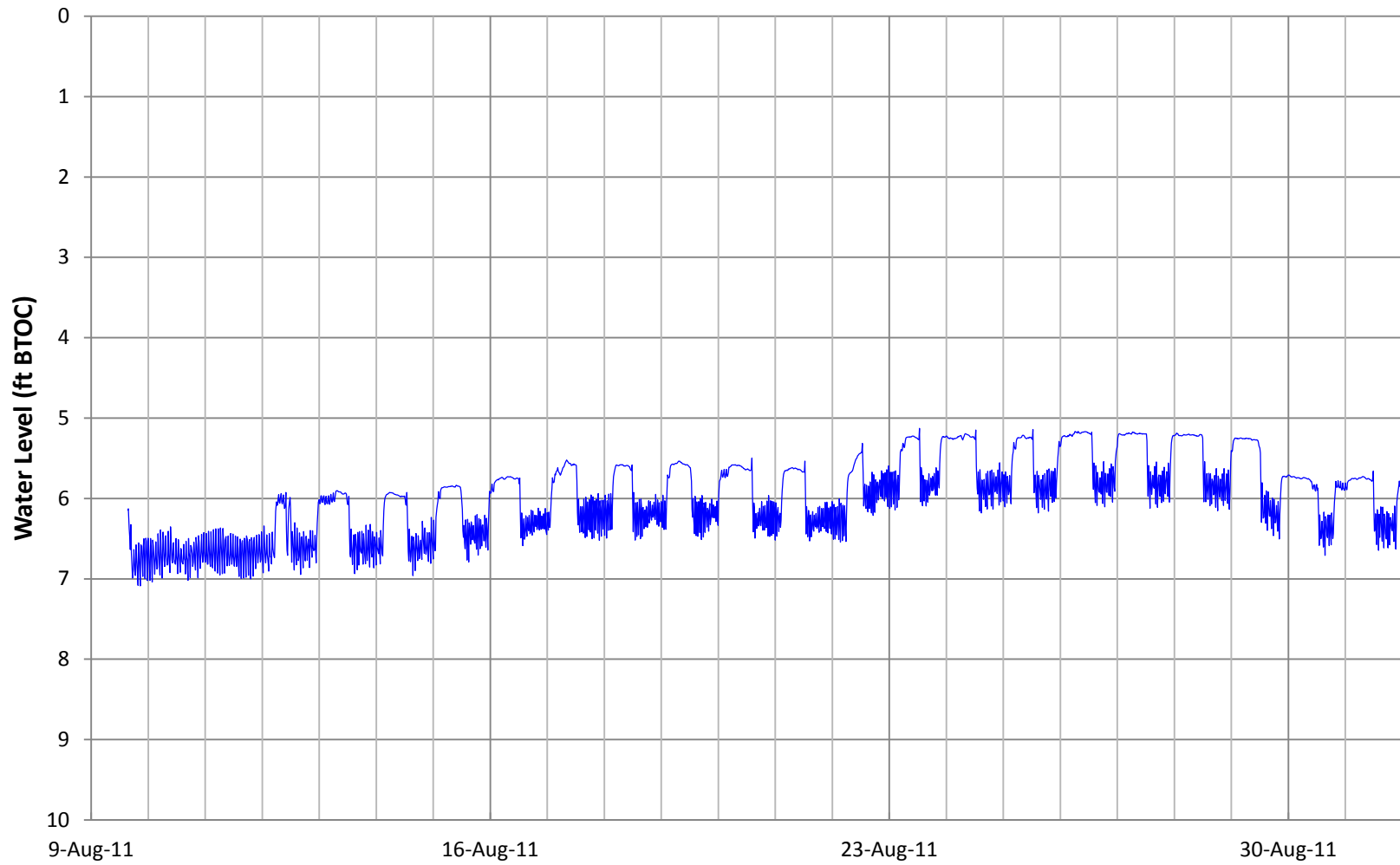


Figure C-4-4B

Water Level in IW0002D1. Month 2. September 2011

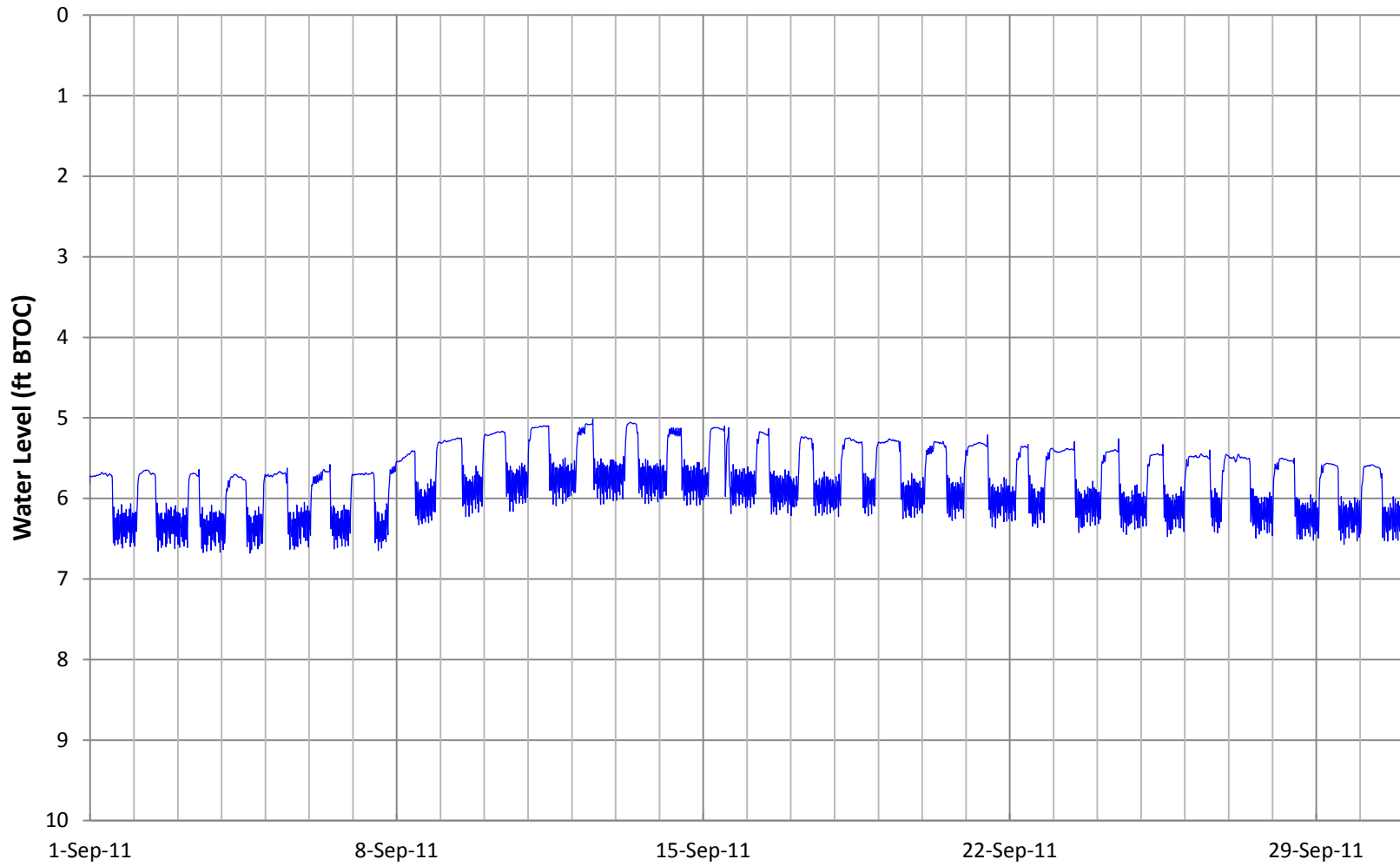


Figure C-4-4C

Water Level in IW0002D1. Month 3. October 2011

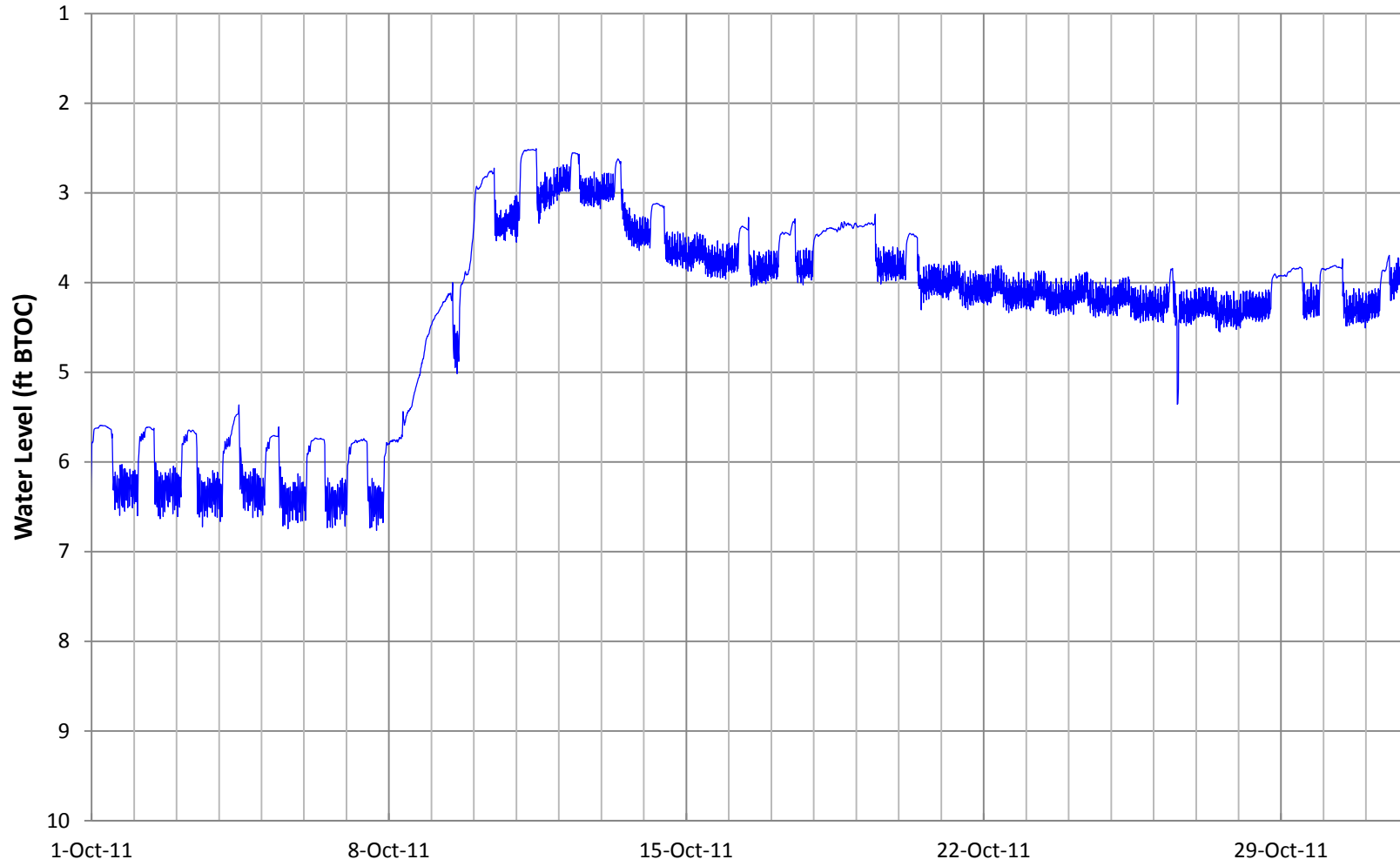


Figure C-4-4D

Water Level in IW0002D1. Month 4. November 2011

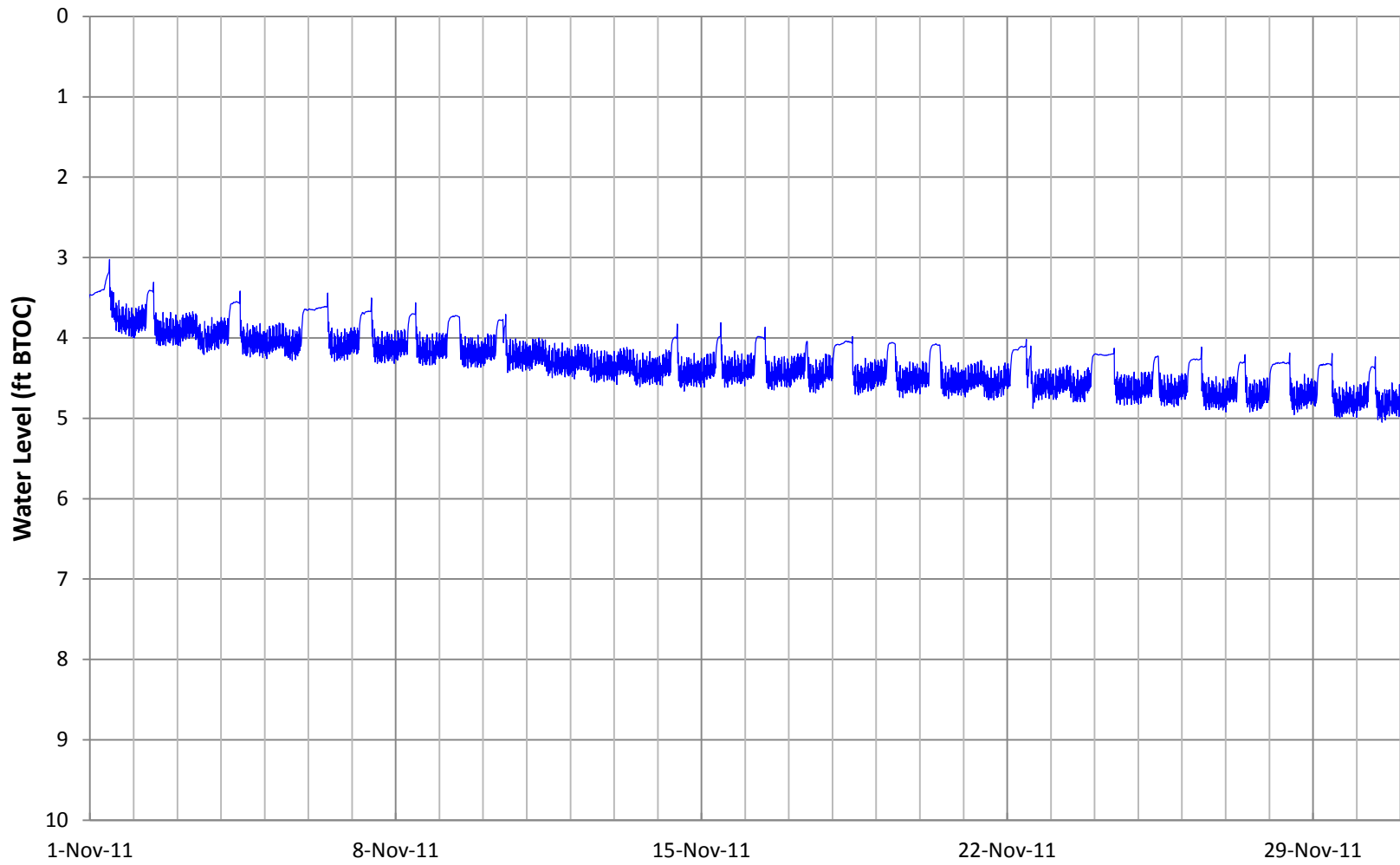


Figure C-4-4E

Water Level in IW0002D1. Month 5. December 2011

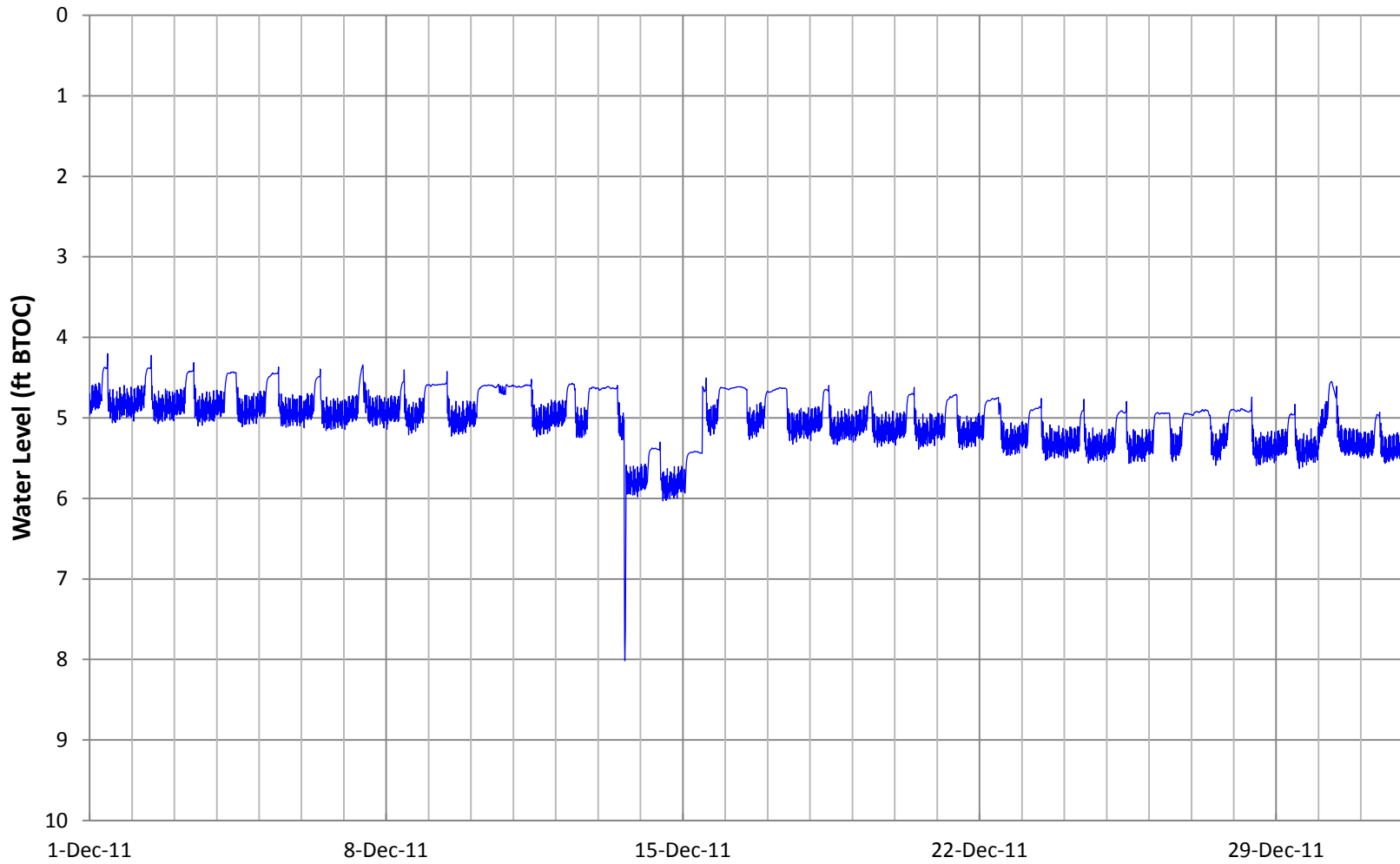


Figure C-4-4F

Water Level in IW0002D1. Month 6. January 2012

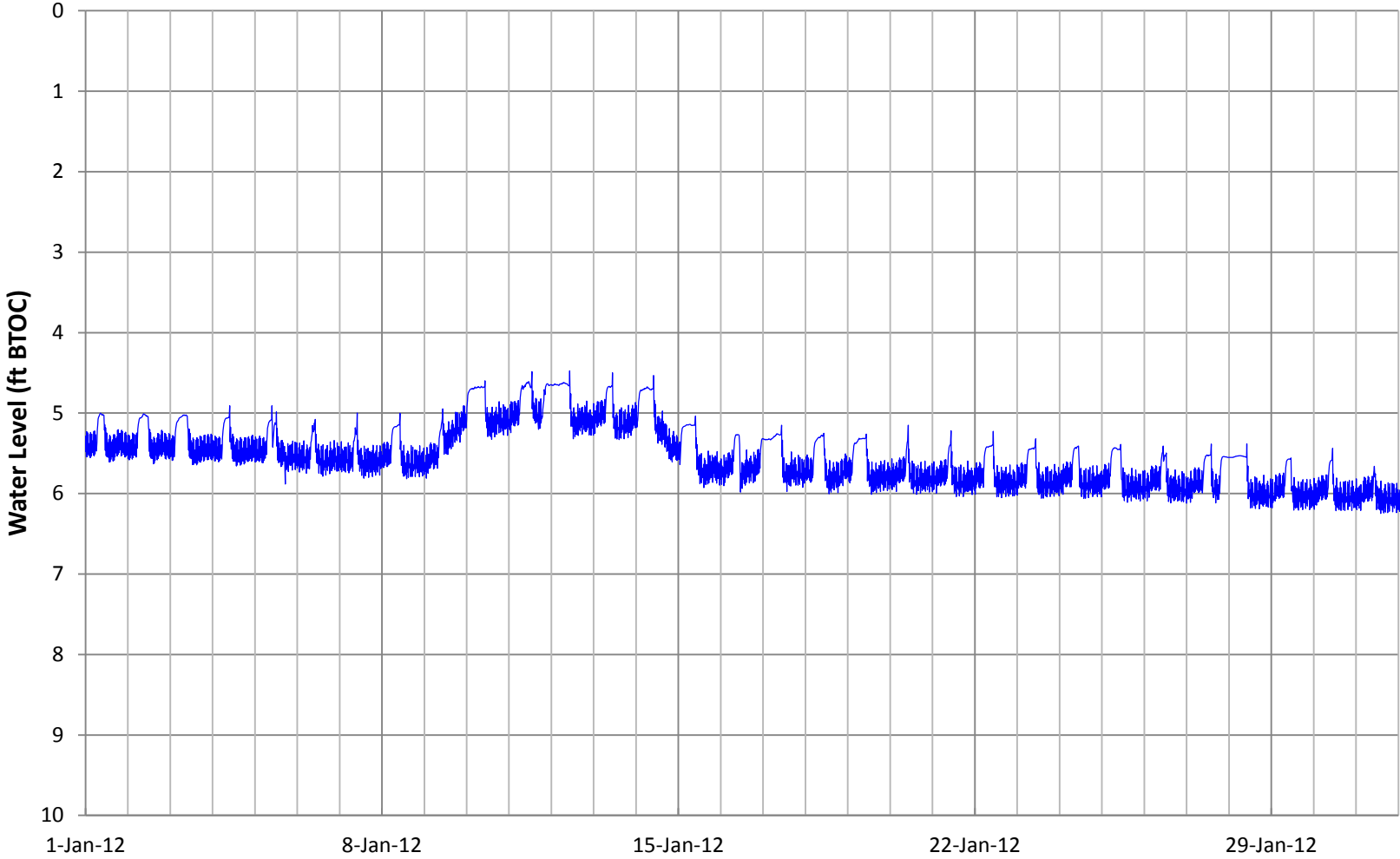


Figure C-4-4G

Water Level in IW0002D1. Month 7. February 2012

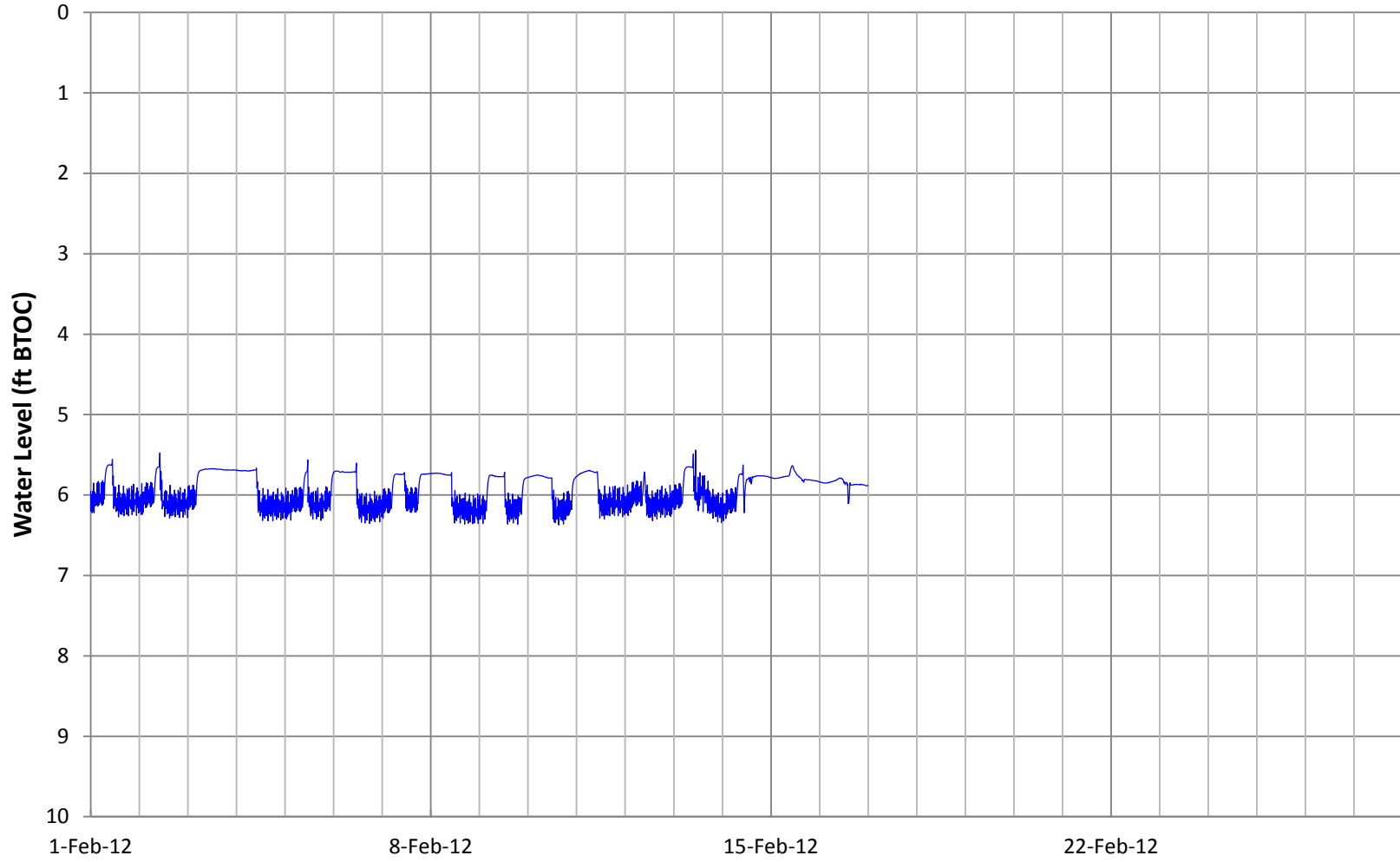


Figure C-4-5A

Water Level in IJ0013. Month 1. August 2011

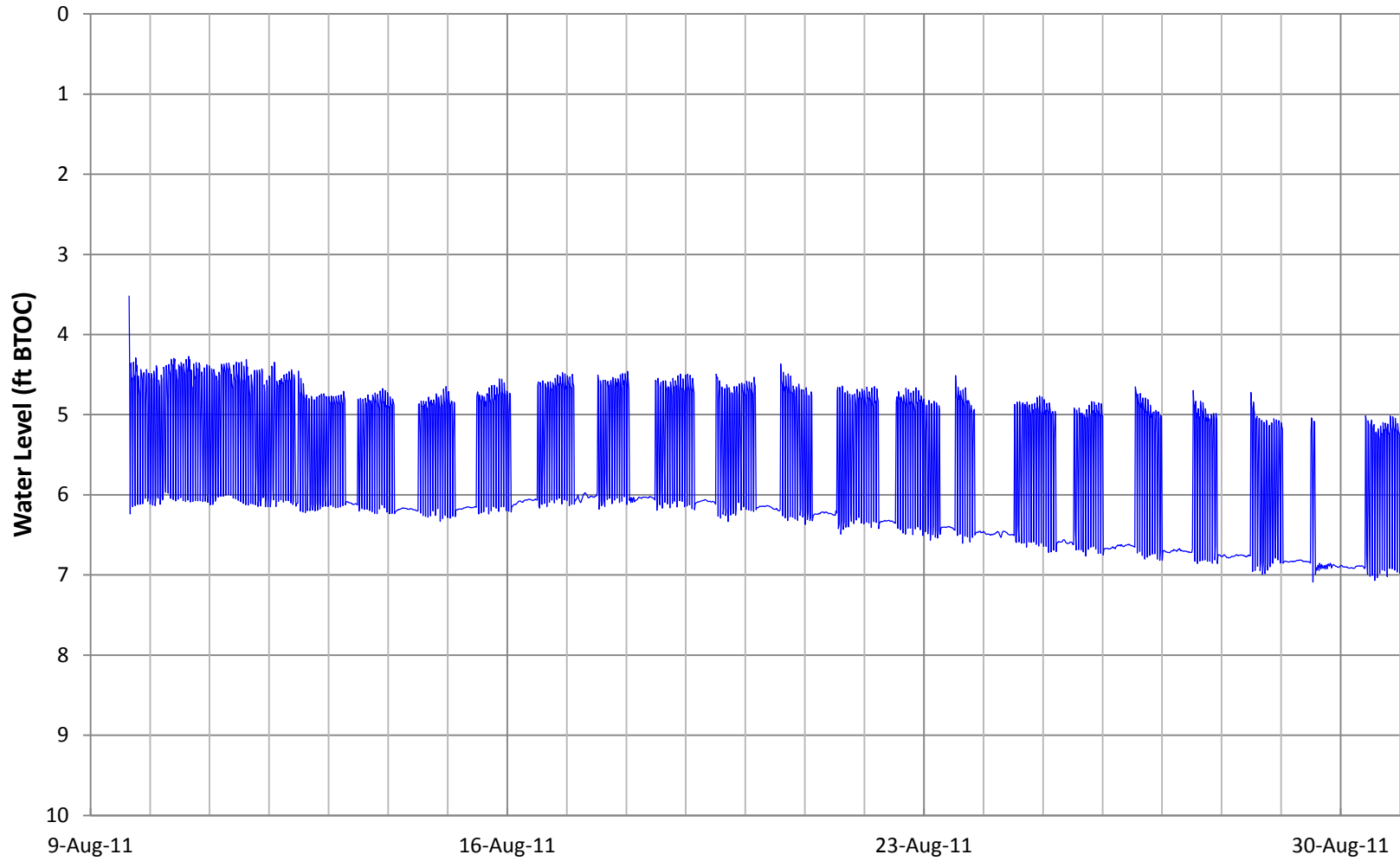


Figure C-4-5B

Water Level in IJ0013. Month 2. September 2011

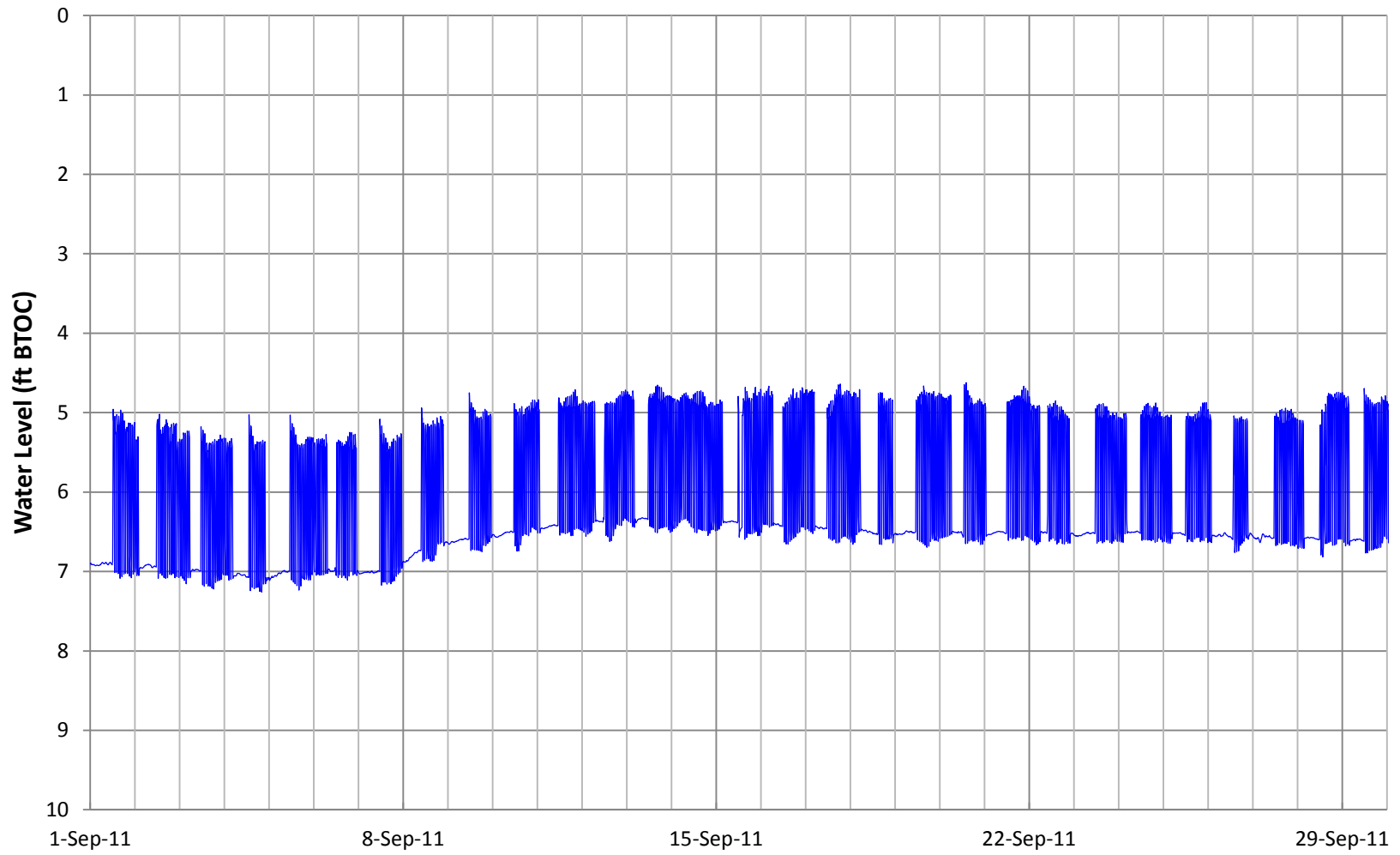


Figure C-4-5C

Water Level in IJ0013. Month 3. October 2011

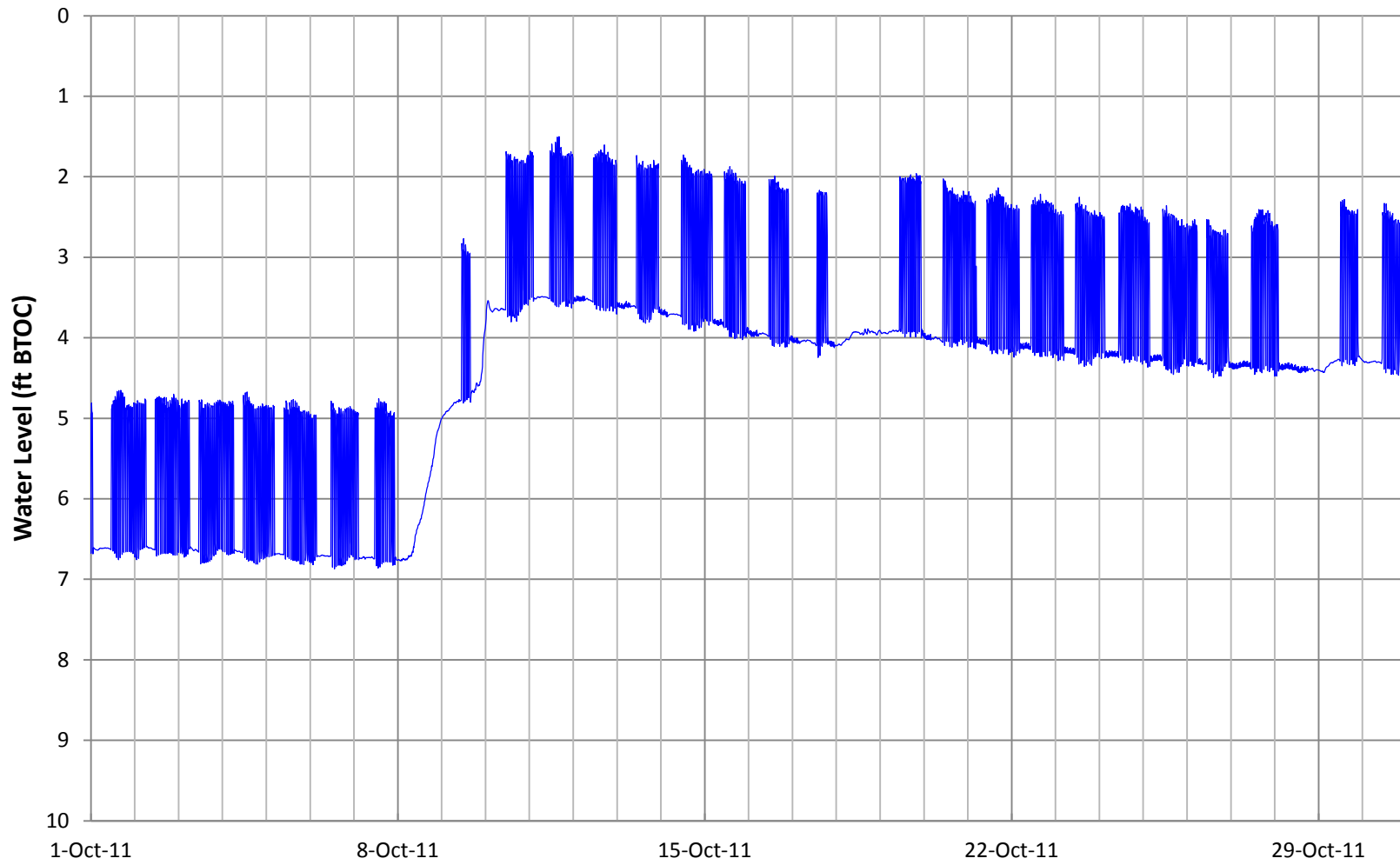


Figure C-4-5D

Water Level in IJ0013. Month 4. November 2011

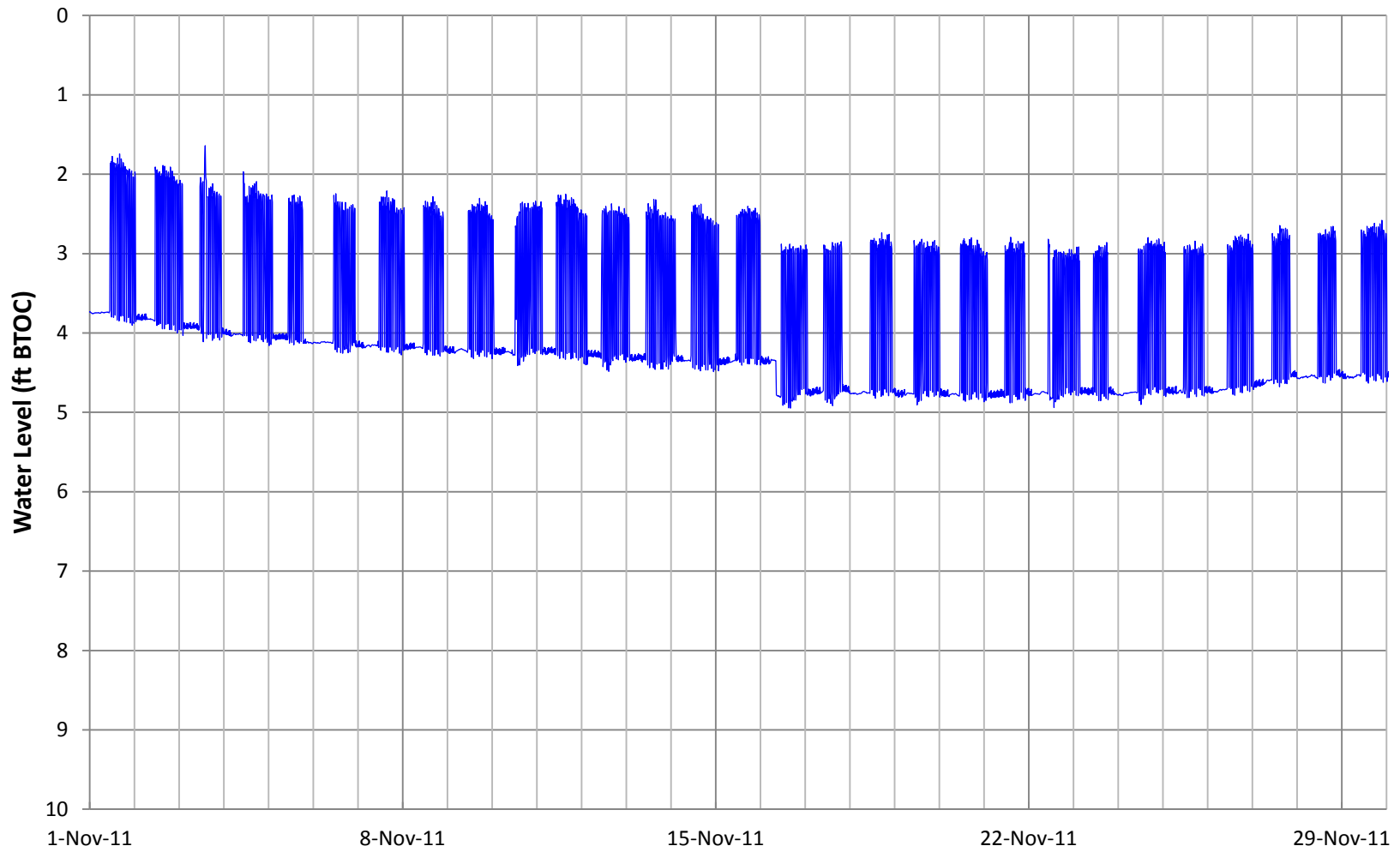


Figure C-4-5E

Water Level in IJ0013. Month 5. December 2011

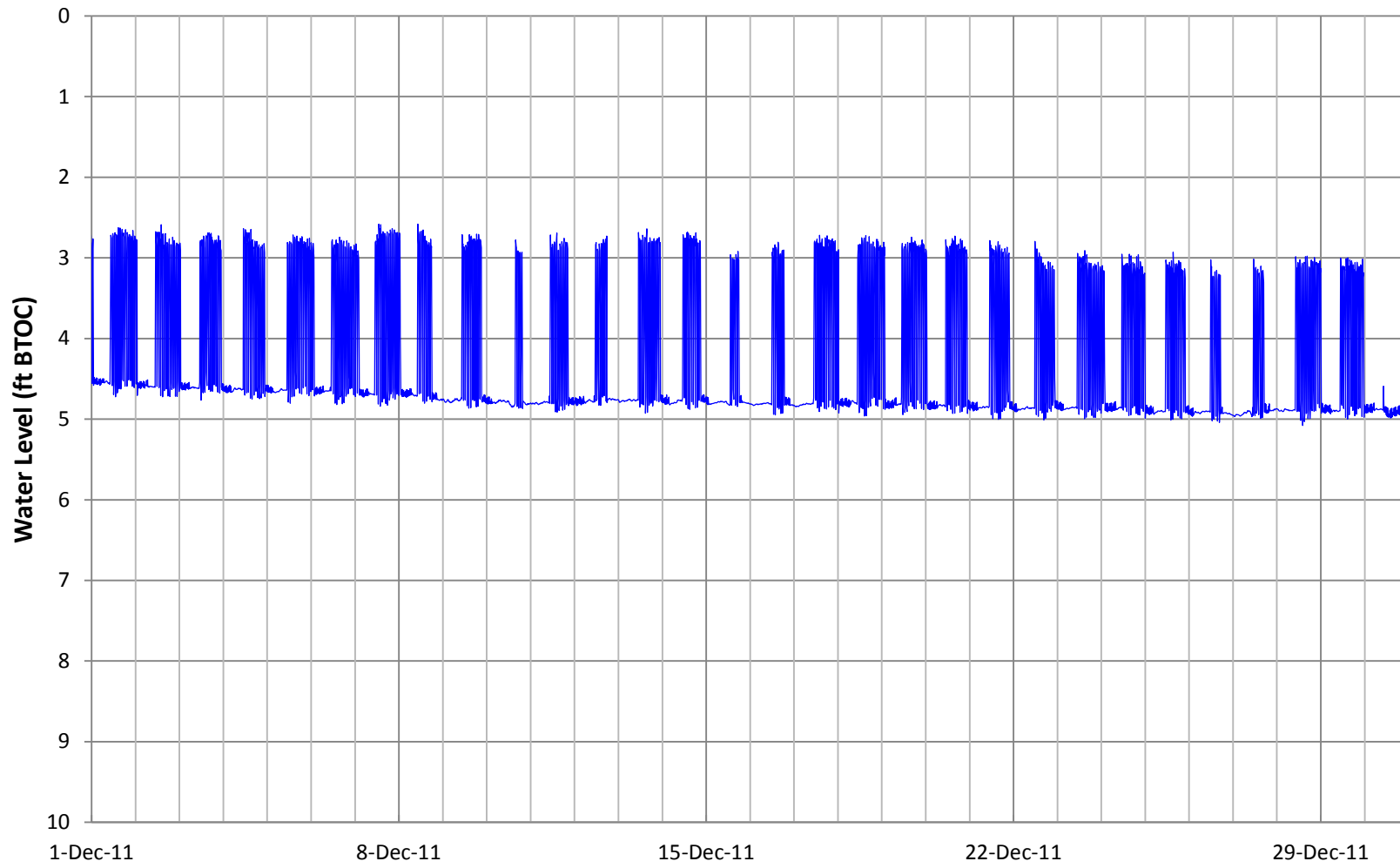


Figure C-4-5F

Water Level in IJ0013. Month 6. January 2012

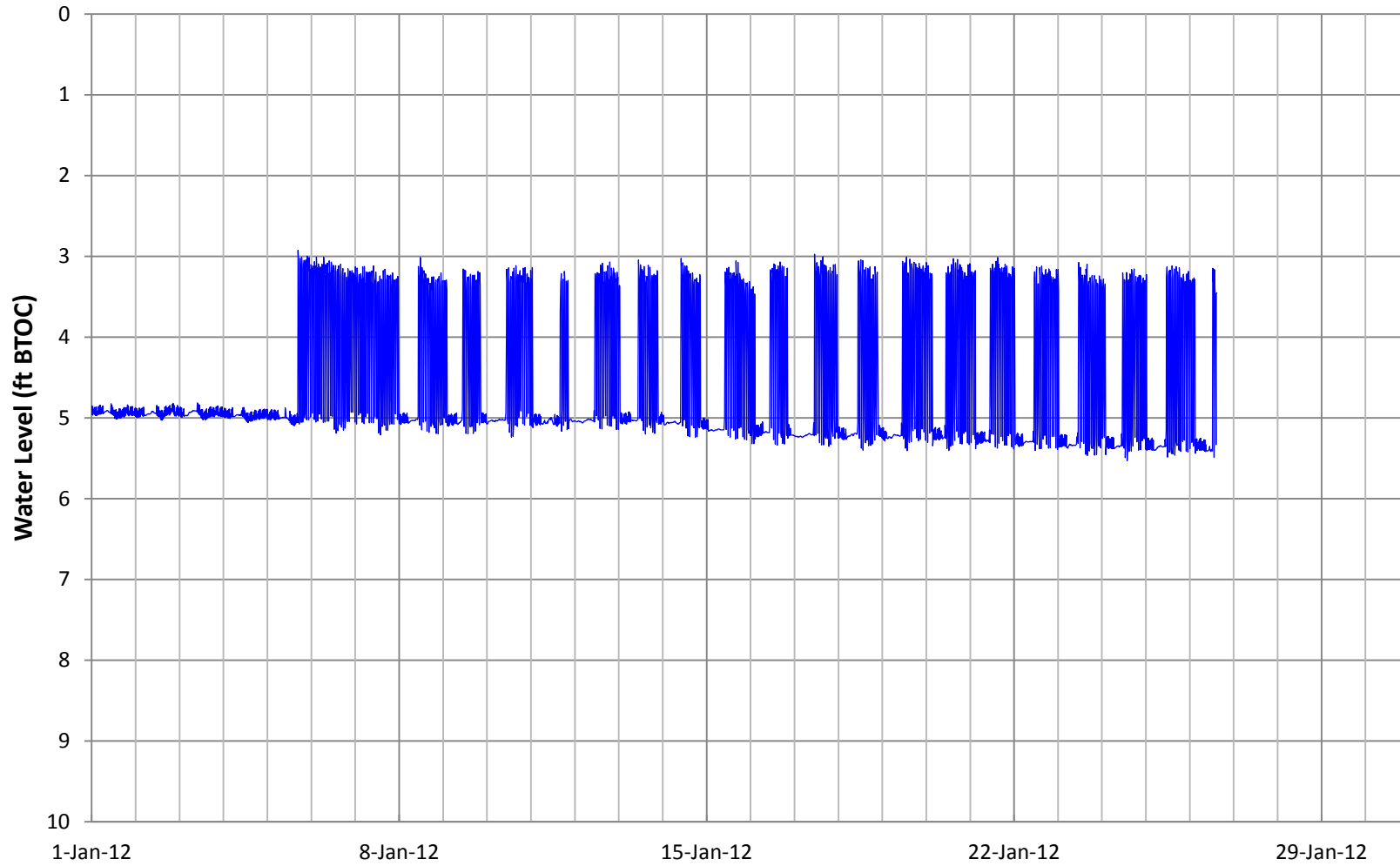


Figure C-4-6A

Water Level in IJ0014. Month 1. August 2011

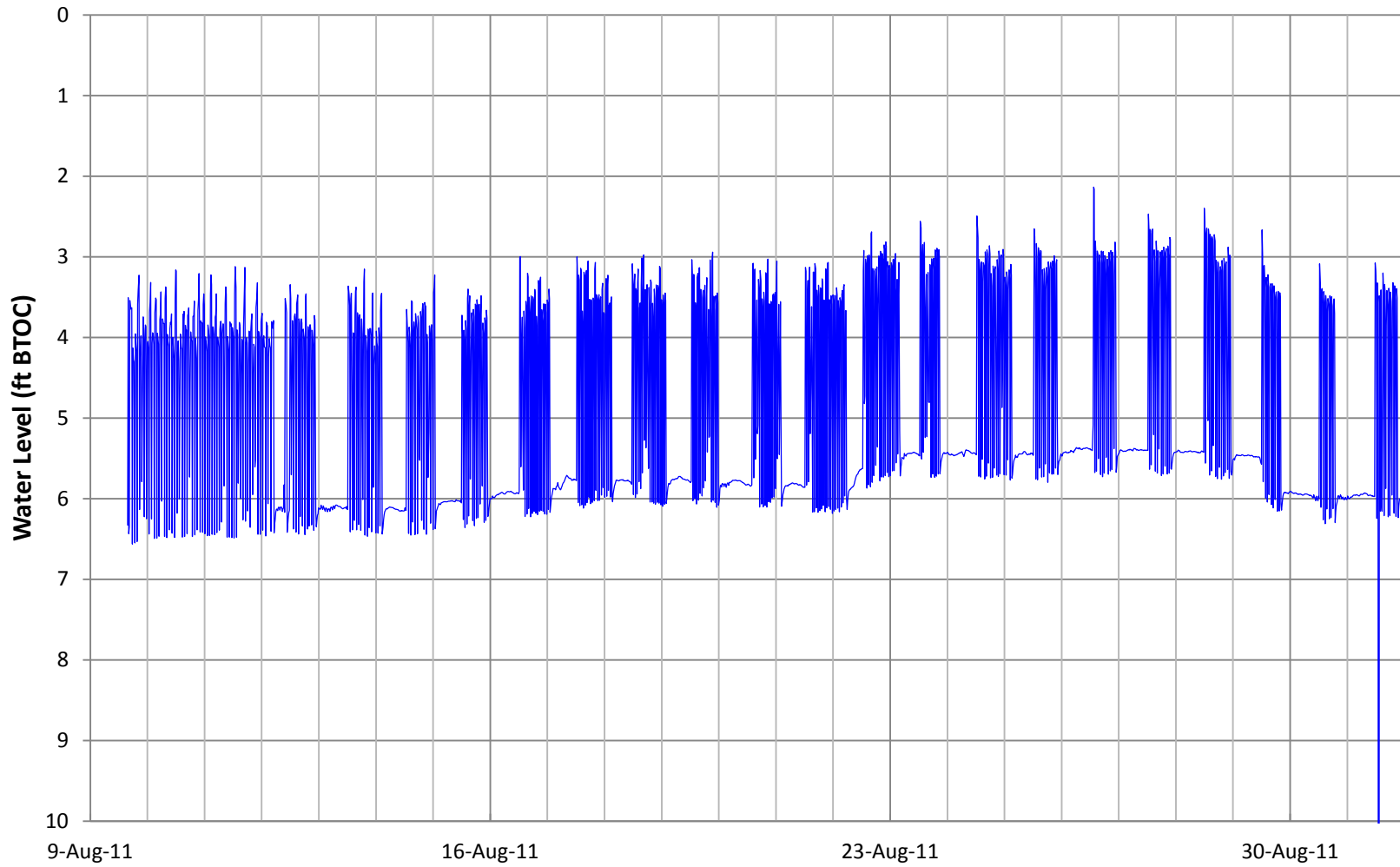


Figure C-4-6B

Water Level in IJ0014. Month 2. September 2011

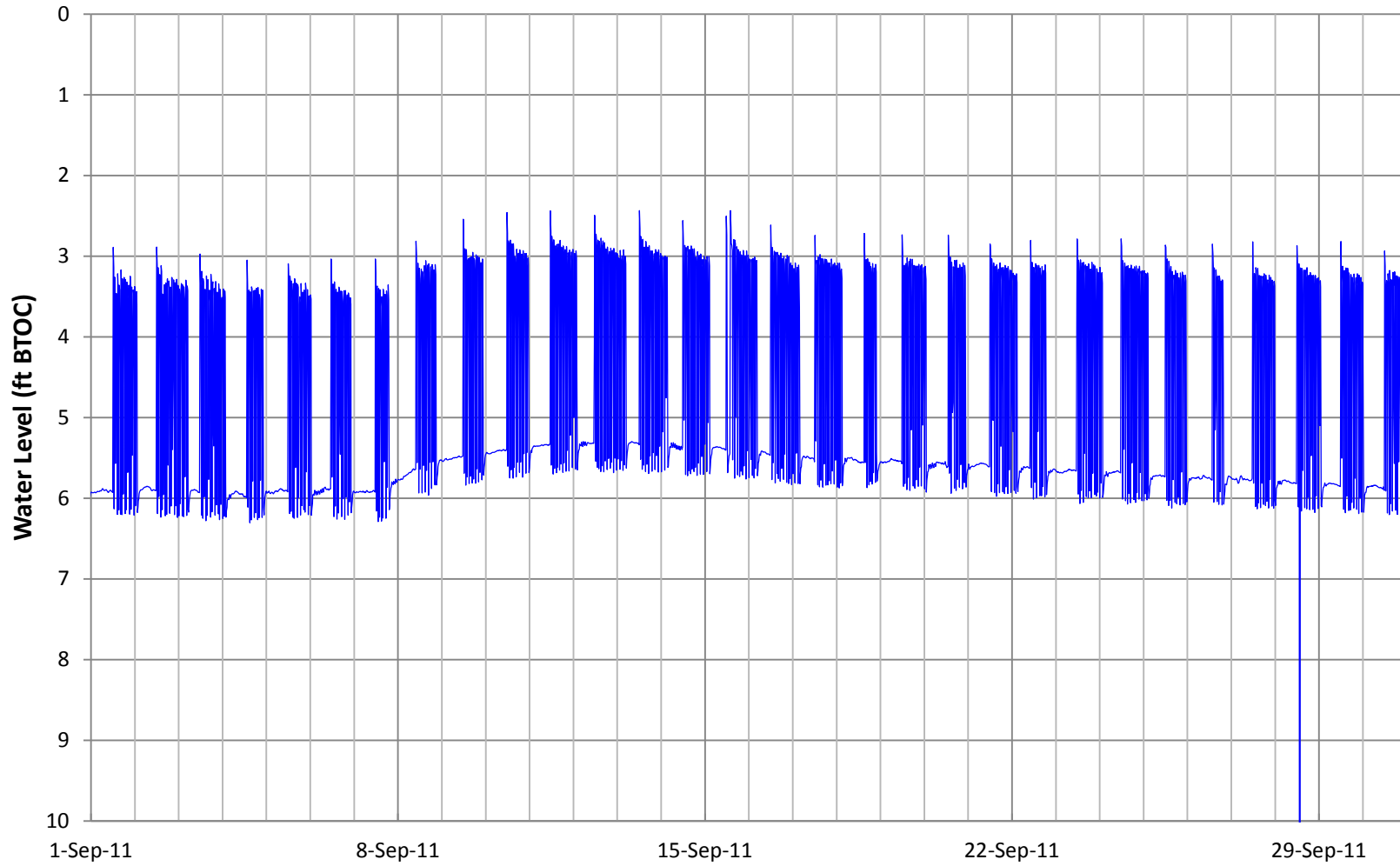


Figure C-4-6C

Water Level in IJ0014. Month 3. October 2011

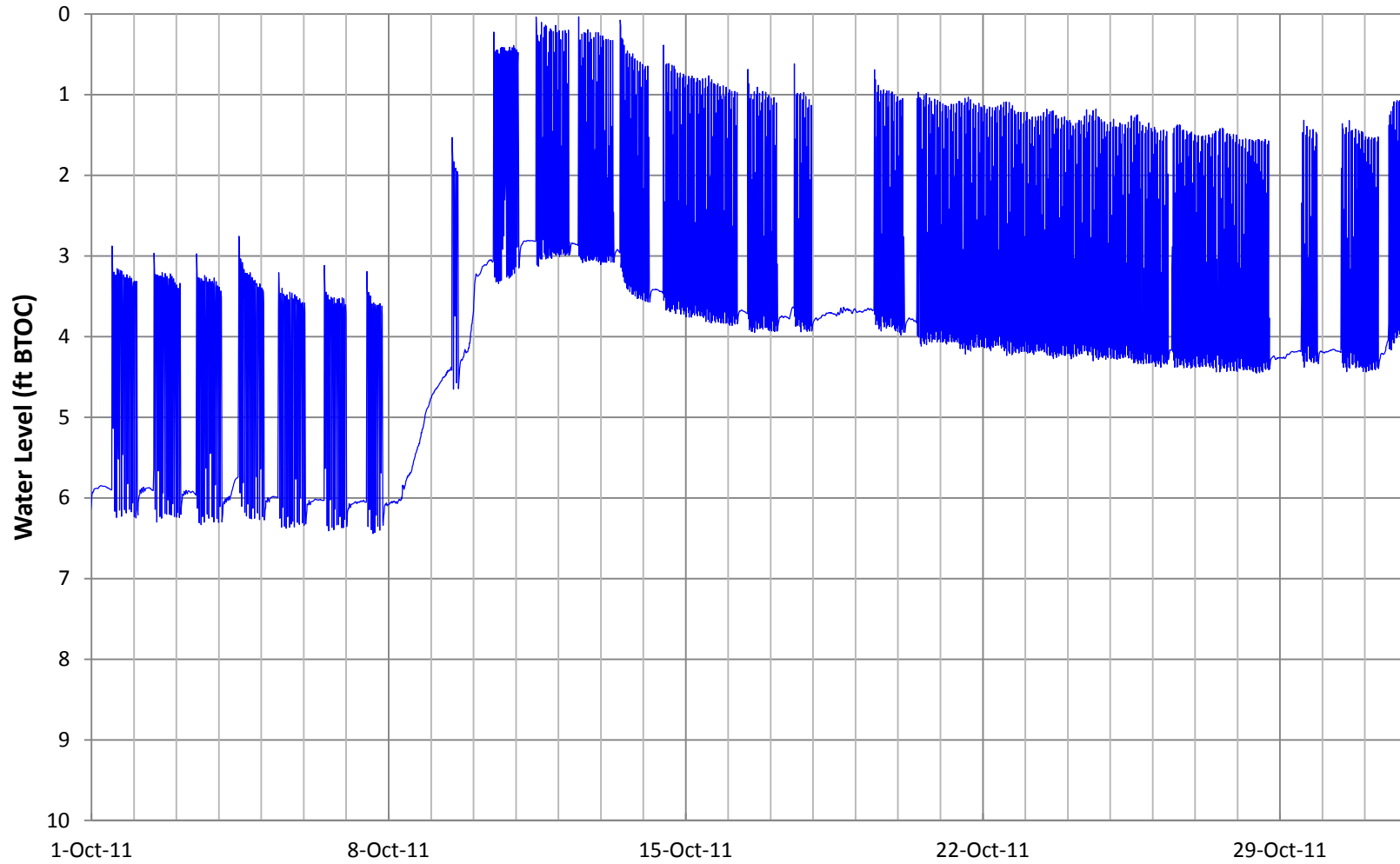


Figure C-4-6D

Water Level in IJ0014. Month 4. November 2011

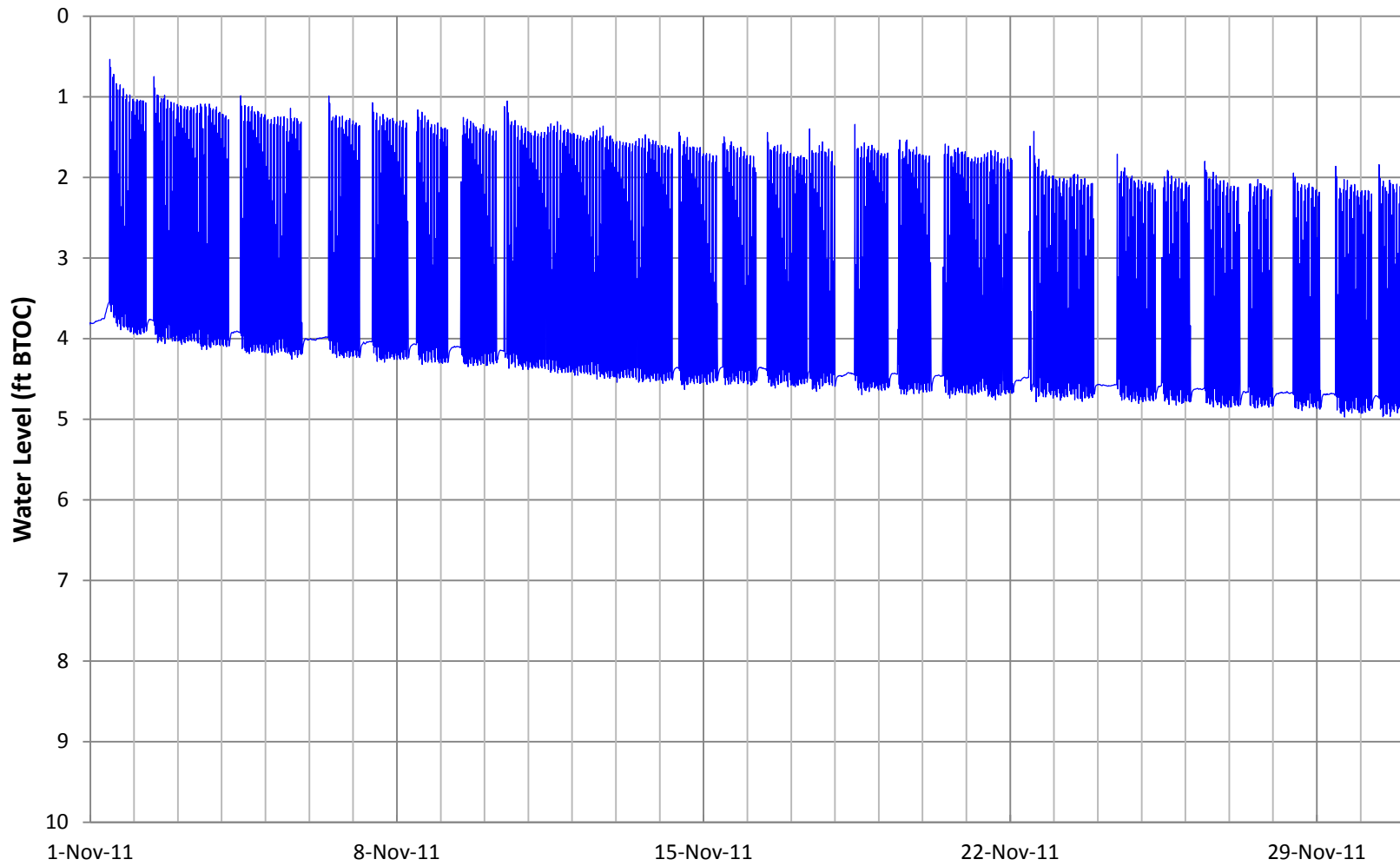


Figure C-4-6E

Water Level in IJ0014. Month 5. December 2011

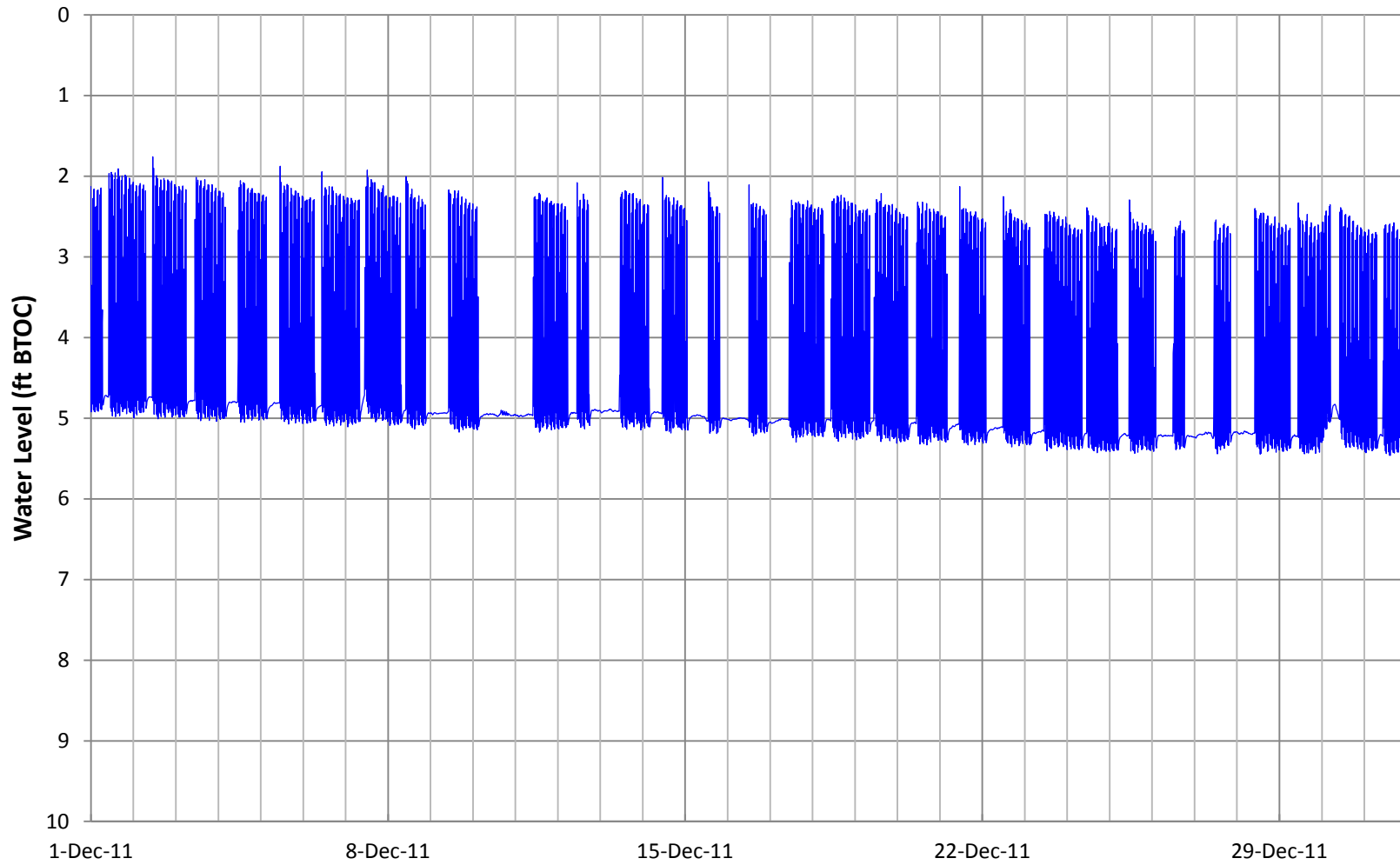


Figure C-4-6F

Water Level in IJ0014. Month 6. January 2012

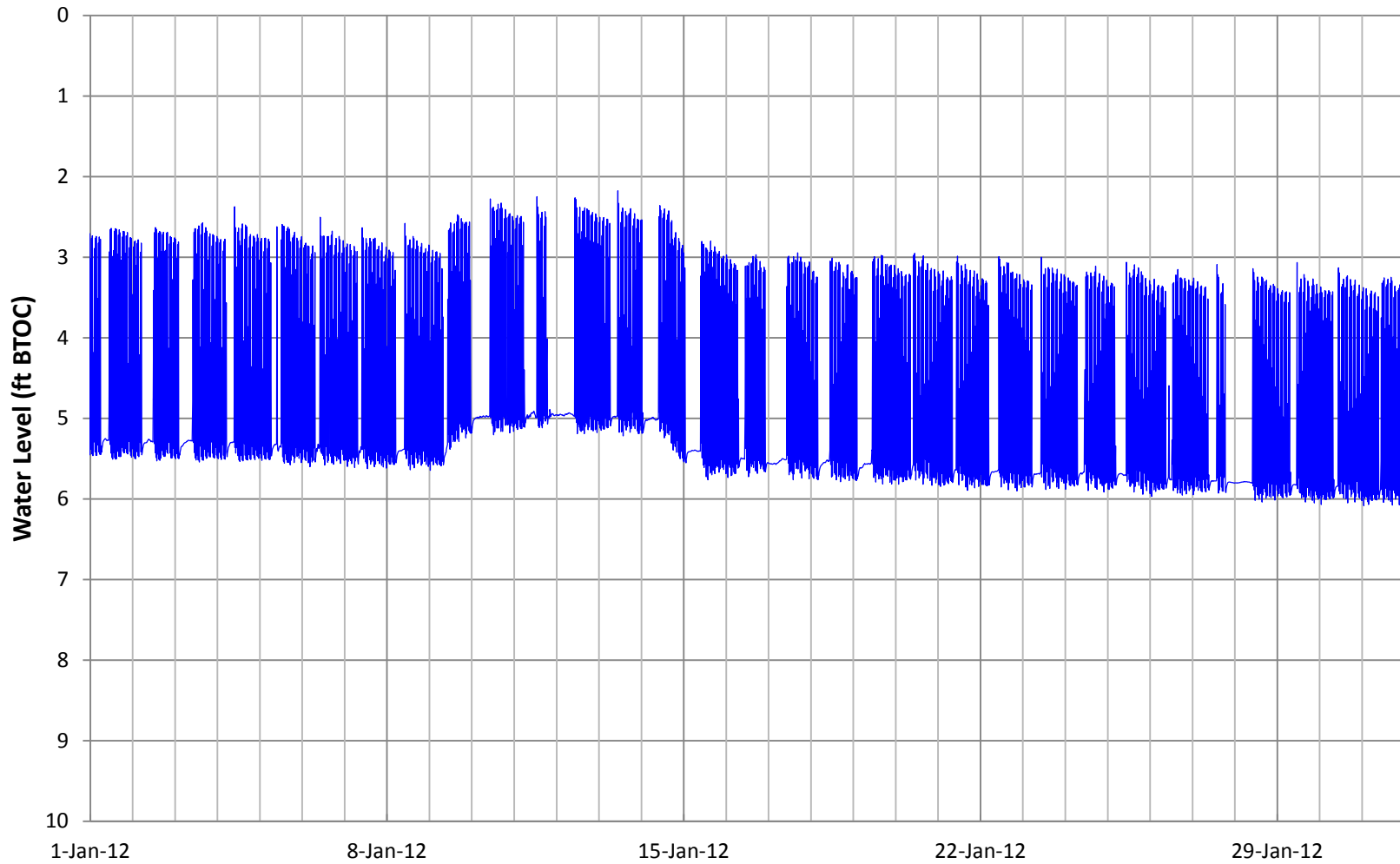
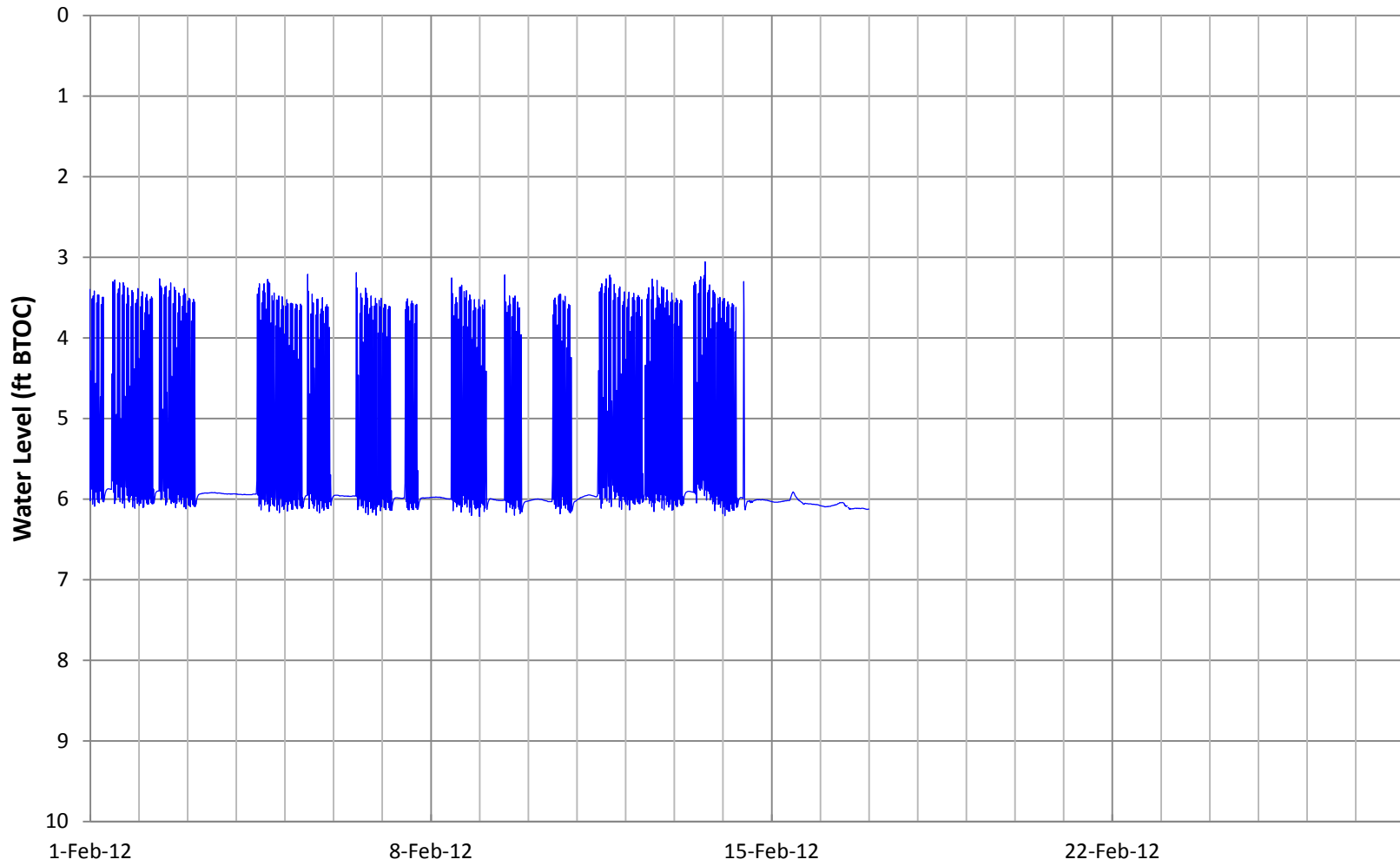


Figure C-4-6G

Water Level in IJ0014. Month 7. February 2012



ATTACHMENT C-5
RECIRCULATED PORE VOLUME ESTIMATES

RW0007

Pore Volume (gal)												
Thickness (ft)	Radius (ft)										Design	
	5	10	16	20	25	30	35	40	45	PED	Sweep	
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	1,234	4,935	12,635	19,742	30,847	44,419	60,460	78,968	99,943	11,783	62,840	
10	1,763	7,051	18,050	28,203	44,067	63,456	86,371	112,811	142,776	16,832	89,772	
15	2,644	10,576	27,075	42,304	66,100	95,184	129,556	169,216	214,164	25,248	134,658	
20	3,525	14,101	36,099	56,405	88,133	126,912	172,742	225,622	285,552	33,665	179,544	
25	4,407	17,627	45,124	70,507	110,167	158,640	215,927	282,027	356,940	42,081	224,430	
30	5,288	21,152	54,149	84,608	132,200	190,368	259,112	338,432	428,329	50,497	269,316	
36	6,346	25,382	64,979	101,530	158,640	228,442	310,935	406,119	513,994	60,596	323,179	

	gal	kgal		porosity	0.3
baseline	58,644	58.6		gal/ft3	7.481
main phase	243,414	243.4		L/gal	3.785
IM phase	240,892	240.9			
total w/ PED	484,306	484.3			

Pore Volumes Extracted (equivalents) during BASELINE												
Thickness (ft)	Radius (ft)										Design	
	5	10	16	20	25	30	35	40	45	PED	Sweep	
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	47.5	11.9	4.6	3.0	1.9	1.3	1.0	0.7	0.6	5.0	0.9	
10	33.3	8.3	3.2	2.1	1.3	0.9	0.7	0.5	0.4	3.5	0.7	
15	22.2	5.5	2.2	1.4	0.9	0.6	0.5	0.3	0.3	2.3	0.4	
20	16.6	4.2	1.6	1.0	0.7	0.5	0.3	0.3	0.2	1.7	0.3	
25	13.3	3.3	1.3	0.8	0.5	0.4	0.3	0.2	0.2	1.4	0.3	
30	11.1	2.8	1.1	0.7	0.4	0.3	0.2	0.2	0.1	1.2	0.2	
36	9.2	2.3	0.9	0.6	0.4	0.3	0.2	0.1	0.1	1.0	0.2	

Pore Volumes Extracted (equivalents) during MAIN PHASE												
Thickness (ft)	Radius (ft)										Design	
	5	10	16	20	25	30	35	40	45	PED	Sweep	
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	197.3	49.3	19.3	12.3	7.9	5.5	4.0	3.1	2.4	20.7	3.9	
10	138.1	34.5	13.5	8.6	5.5	3.8	2.8	2.2	1.7	14.5	2.7	
15	92.1	23.0	9.0	5.8	3.7	2.6	1.9	1.4	1.1	9.6	1.8	
20	69.0	17.3	6.7	4.3	2.8	1.9	1.4	1.1	0.9	7.2	1.4	
25	55.2	13.8	5.4	3.5	2.2	1.5	1.1	0.9	0.7	5.8	1.1	
30	46.0	11.5	4.5	2.9	1.8	1.3	0.9	0.7	0.6	4.8	0.9	
36	38.4	9.6	3.7	2.4	1.5	1.1	0.8	0.6	0.5	4.0	0.8	

Pore Volumes Extracted (equivalents) during IM PHASE												
Thickness (ft)	Radius (ft)										Design	
	5	10	16	20	25	30	35	40	45	PED	Sweep	
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	195.2	48.8	19.1	12.2	7.8	5.4	4.0	3.1	2.4	20.4	3.8	
10	136.7	34.2	13.3	8.5	5.5	3.8	2.8	2.1	1.7	14.3	2.7	
15	91.1	22.8	8.9	5.7	3.6	2.5	1.9	1.4	1.1	9.5	1.8	
20	68.3	17.1	6.7	4.3	2.7	1.9	1.4	1.1	0.8	7.2	1.3	
25	54.7	13.7	5.3	3.4	2.2	1.5	1.1	0.9	0.7	5.7	1.1	
30	45.6	11.4	4.4	2.8	1.8	1.3	0.9	0.7	0.6	4.8	0.9	
36	38.0	9.5	3.7	2.4	1.5	1.1	0.8	0.6	0.5	4.0	0.7	

RW0008

Pore Volume (gal)											Design	
Thickness (ft)	Radius (ft)										PED	Sweep
	5	10	16	20	25	30	35	40	45			
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	1,234	4,935	12,635	19,742	30,847	44,419	60,460	78,968	99,943	11,783	62,840	
10	1,763	7,051	18,050	28,203	44,067	63,456	86,371	112,811	142,776	16,832	89,772	
15	2,644	10,576	27,075	42,304	66,100	95,184	129,556	169,216	214,164	25,248	134,658	
20	3,525	14,101	36,099	56,405	88,133	126,912	172,742	225,622	285,552	33,665	179,544	
25	4,407	17,627	45,124	70,507	110,167	158,640	215,927	282,027	356,940	42,081	224,430	
30	5,288	21,152	54,149	84,608	132,200	190,368	259,112	338,432	428,329	50,497	269,316	
36	6,346	25,382	64,979	101,530	158,640	228,442	310,935	406,119	513,994	60,596	323,179	

baseline	gal	43,998	kgal	44.0	porosity	0.3
main phase	gal	221,647	kgal	221.6	gal/ft3	7.481
IM phase	gal	239,179	kgal	239.2	L/gal	3.785
total w/ PED	gal	460,826	kgal	460.8		

Pore Volumes Extracted (equivalents) during BASELINE											Design	
Thickness	Radius										PED	Sweep
	5	10	16	20	25	30	35	40	45			
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	35.7	8.9	3.5	2.2	1.4	1.0	0.7	0.6	0.4	3.7	0.7	
10	25.0	6.2	2.4	1.6	1.0	0.7	0.5	0.4	0.3	2.6	0.5	
15	16.6	4.2	1.6	1.0	0.7	0.5	0.3	0.3	0.2	1.7	0.3	
20	12.5	3.1	1.2	0.8	0.5	0.3	0.3	0.2	0.2	1.3	0.2	
25	10.0	2.5	1.0	0.6	0.4	0.3	0.2	0.2	0.1	1.0	0.2	
30	8.3	2.1	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.9	0.2	
36	6.9	1.7	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.7	0.1	

Pore Volumes Extracted (equivalents) during MAIN PHASE											Design	
Thickness	Radius										PED	Sweep
	5	10	16	20	25	30	35	40	45			
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	179.6	44.9	17.5	11.2	7.2	5.0	3.7	2.8	2.2	18.8	3.5	
10	125.7	31.4	12.3	7.9	5.0	3.5	2.6	2.0	1.6	13.2	2.5	
15	83.8	21.0	8.2	5.2	3.4	2.3	1.7	1.3	1.0	8.8	1.6	
20	62.9	15.7	6.1	3.9	2.5	1.7	1.3	1.0	0.8	6.6	1.2	
25	50.3	12.6	4.9	3.1	2.0	1.4	1.0	0.8	0.6	5.3	1.0	
30	41.9	10.5	4.1	2.6	1.7	1.2	0.9	0.7	0.5	4.4	0.8	
36	34.9	8.7	3.4	2.2	1.4	1.0	0.7	0.5	0.4	3.7	0.7	

Pore Volumes Extracted (equivalents) during IM PHASE											Design	
Thickness	Radius										PED	Sweep
	5	10	16	20	25	30	35	40	45			
area (ft ²)	79	314	804	1257	1963	2827	3848	5027	6362	750	4000	
7	193.8	48.5	18.9	12.1	7.8	5.4	4.0	3.0	2.4	20.3	3.8	
10	135.7	33.9	13.3	8.5	5.4	3.8	2.8	2.1	1.7	14.2	2.7	
15	90.5	22.6	8.8	5.7	3.6	2.5	1.8	1.4	1.1	9.5	1.8	
20	67.8	17.0	6.6	4.2	2.7	1.9	1.4	1.1	0.8	7.1	1.3	
25	54.3	13.6	5.3	3.4	2.2	1.5	1.1	0.8	0.7	5.7	1.1	
30	45.2	11.3	4.4	2.8	1.8	1.3	0.9	0.7	0.6	4.7	0.9	
36	37.7	9.4	3.7	2.4	1.5	1.0	0.8	0.6	0.5	3.9	0.7	

APPENDIX D

SAMPLING PROGRAM TABLES

**TABLE D-1
GROUNDWATER SAMPLING SCHEDULE
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Event	Stage 4 - PED Injection											Stage 5 - Biomass Growth											
	Confirmation Snapshot - Distribution at Wells																						
Monitoring Well	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHGs ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHGs ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	
Upper Zone / within Silty Clay																							
RW0007		X		X								X	X	X	X	X	X	X	X	X	X	X	
IW0002I												X	X	X	X	X	X	X	X	X	X	X	
IW0002D												X	X	X	X	X	X	X	X	X	X	X	
BW0001A												X	X	X	X	X	X	X	X	X	X	X	
BW0001B												X	X	X	X	X	X	X	X	X	X	X	
BW0001C		X		X								X	X	X	X	X	X	X	X	X	X	X	
BW0001D		X		X								X	X	X	X	X	X	X	X	X	X	X	
BW0002A												X	X	X	X	X	X						
BW0002B												X	X	X	X	X	X						
BW0002C		X		X								X	X	X	X	X	X	X	X	X			
BW0002D		X		X								X	X	X	X	X	X						
BW0003A												X	X	X	X	X	X						
BW0003B												X	X	X	X	X	X						
BW0003C		X		X								X	X	X	X	X	X	X	X	X			
BW0003D		X		X								X	X	X	X	X	X						
Lower Zone																							
RW0008		X		X								X	X	X	X	X	X	X	X	X	X	X	
IW0002DI												X	X	X	X	X	X	X	X	X	X	X	
BW0001E		X		X								X	X	X	X	X	X	X	X	X	X	X	
BW0001F												X	X	X	X	X	X	X	X	X	X	X	
BW0002E		X		X								X	X	X	X	X	X						
BW0002F												X	X	X	X	X	X						
BW0003E		X		X								X	X	X	X	X	X						
BW0003F												X	X	X	X	X	X						
Outside the Treatment Area																							
IW0076 (below)												X	X	X	X	X	X					X	
IW0067D																							
IW0067D1																							
IW0070D																							
IW0070D1																							
IW0071D																							
IW0071D1																							

TABLE D-1
GROUNDWATER SAMPLING SCHEDULE
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Event	Stage 6 - System Operation											Stage 6 - System Operation											Stage 6 - System Operation																						
	Weekly (for first month) & Bi-weekly (for five months)											Snapshot (Month 3)											Snapshot (Month 7)																						
Monitoring Well	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHG ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHG ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHG ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹												
Upper Zone / within Silty Clay																																													
RW0007	X	X	X	X	X	X	X	X	X	X	X ¹²	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
IW0002I												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
IW0002D												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001A												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001B												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001C												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001D												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0002A												X	X	X	X	X	X							X	X	X	X	X	X																
BW0002B												X	X	X	X	X	X							X	X	X	X	X	X																
BW0002C												X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X												
BW0002D												X	X	X	X	X	X							X	X	X	X	X	X																
BW0003A												X	X	X	X	X	X							X	X	X	X	X	X																
BW0003B												X	X	X	X	X	X							X	X	X	X	X	X																
BW0003C												X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X												
BW0003D												X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X												
Lower Zone																																													
RW0008	X	X	X	X	X	X	X	X	X	X	X ¹²	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
IW0002DI												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001E												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0001F												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
BW0002E												X	X	X	X	X	X							X	X	X	X	X	X																
BW0002F												X	X	X	X	X	X							X	X	X	X	X	X																
BW0003E												X	X	X	X	X	X							X	X	X	X	X	X																
BW0003F												X	X	X	X	X	X							X	X	X	X	X	X																
Outside the Treatment Area																																													
IW0076 (below)												X	X	X	X	X	X						X	X	X	X	X	X	X								X								
IW0067D												X	X											X	X			X																	
IW0067D1												X	X											X	X			X																	
IW0070D												X	X											X	X			X																	
IW0070D1												X	X											X	X			X																	
IW0071D												X	X											X	X			X																	
IW0071D1												X	X											X	X			X																	

**TABLE D-1
GROUNDWATER SAMPLING SCHEDULE
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Event	Stage 7 - Interim Measures											Stage 7 - Interim Measures											Stage 7 - Interim Measures														
	Monthly											Snapshot (Month 10)											Snapshot (Month 13)														
	Monitoring Well	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHGs ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHGs ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹	FP ¹	VOCs ²	VFAs ³	Tracers ⁴	TOC ⁵	DHGs ⁶	Sulfide ⁷	Anions ⁸	Alkalinity ⁹	Dissolved Metals ¹⁰	DHC Assay ¹¹			
Upper Zone / within Silty Clay																																					
RW0007	X	X										X	X			X	X						X	X	X			X	X						X		
IW0002I												X	X			X	X						X	X	X			X	X						X		
IW0002D												X	X			X	X						X	X	X			X	X						X		
BW0001A												X	X			X	X						X	X	X			X	X						X		
BW0001B												X	X			X	X						X	X	X			X	X						X		
BW0001C												X	X			X	X					X	X	X			X	X							X		
BW0001D												X	X			X	X					X	X	X			X	X							X		
BW0002A												X	X			X	X					X	X	X			X	X									
BW0002B												X	X			X	X					X	X	X			X	X									
BW0002C												X	X			X	X					X	X	X			X	X									
BW0002D												X	X			X	X					X	X	X			X	X									
BW0003A												X	X			X	X					X	X	X			X	X									
BW0003B												X	X			X	X					X	X	X			X	X									
BW0003C												X	X			X	X					X	X	X			X	X							X		
BW0003D												X	X			X	X					X	X	X			X	X									
Lower Zone																																					
RW0008	X	X										X	X			X	X					X	X	X			X	X							X		
IW0002DI												X	X			X	X					X	X	X			X	X							X		
BW0001E												X	X			X	X					X	X	X			X	X							X		
BW0001F												X	X			X	X					X	X	X			X	X									
BW0002E												X	X			X	X					X	X	X			X	X									
BW0002F												X	X			X	X					X	X	X			X	X									
BW0003E												X	X			X	X					X	X	X			X	X							X		
BW0003F												X	X			X	X					X	X	X			X	X									
Outside the Treatment Area																																					
IW0076 (below)												X	X			X	X					X	X	X			X	X									
IW0067D												X	X																								
IW0067D1												X	X																								
IW0070D												X	X																								
IW0070D1												X	X																								
IW0071D												X	X																								
IW0071D1												X	X																								

Notes

- ¹ Field Parameters (FP) are pH, dissolved oxygen, oxidation-reduction potential, specific conductivity, temperature and groundwater elevation
- ² VOCs are Chlorinated Volatile Organic Compounds plus n-butyl acetate (the PED) and n-butanol
- ³ VFAs are Volatile Fatty Acids (includes acetic, butyric, lactic and propionic acids)
- ⁴ Tracers include bromide and iodide
- ⁵ TOC is Total Organic Carbon
- ⁶ DHGs are Dissolved Hydrocarbon Gases (i.e., methane, ethene and ethane)
- ⁷ Sulfide is Total Sulfides
- ⁸ Anions include chloride, sulfate, nitrate and nitrite
- ⁹ Alkalinity is Total Alkalinity
- ¹⁰ Dissolved Metals includes iron, manganese and arsenic
- ¹¹ DHC Assay refers to quantitative polymerase chain reaction (qPCR) analysis using the 16S rRNA gene (i.e., SiREM Laboratory's Gene-Trac-Dhc analysis) or the qPCR method used to quantify the Dehalococcoides vinyl chloride reductase (vcrA)
- ¹² DHC Assay samples were collected monthly and archived

APPENDIX E
DATA SUMMARY

APPENDIX E

DATA SUMMARY

This appendix presents all of the data that was collected during the DEM/VAL, including that collected for the Interim Measure Work Plan (IMWP) for NASA, referred to in this report as the Interim Measure Recirculation Phase.

E.1 SOIL SAMPLING RESULTS

Soil VOC results are presented in Table E-1-1 in Attachment E-1 to this Appendix. The laboratory reports from these sampling events are provided in Appendix G. Samples were collected four times over the course of the DEM/VAL: Baseline, post-Biomass Growth Phase, post-Main Recirculation Phase, and post-Interim Measure Recirculation Phase. The sampling locations are shown in Figure 17 (main document). Baseline samples were collected at the locations of extraction well RW0008 and the three bundle wells. The PED, nBA and its degradation intermediate nBuOH were not detected above the method detection limits in the baseline soil samples that were collected. Baseline organic carbon samples were collected, the fraction of organic carbon (f_{oc}) ranged from 0.00065 to 0.00311 (see Table E-1-2 in Attachment E-1). The highest TCE concentration detected was 22 mg/kg^{wet}, which is well below the 300 mg/kg that is considered representative of NAPL-phase TCE at the site but similar to the 43 mg/kg measured during previous soil coring. This sample was collected from location SB1003 (at BW0001) at a depth of 44 ft BLS, within the silty clay. The maximum TCE concentration in each boring occurred at a similar depth of 44 to 45 ft BLS, although the other locations sampled did not have much TCE.

For the rest of the DEM/VAL, soil sample collection focused on three areas (refer to Figure 17). One was adjacent to the extraction wells (and SB1001) (DPT0332, DPT0346, DPT0349), one was located southwest of BW0001 (and SB1003) (DPT0333, DPT0347, DPT0350), and one was located northeast of BW0001 (and SB1003) (DPT0334, DPT0348, DPT0351).

The samples collected at the end of the Biomass Growth Phase contained higher concentrations of TCE than the baseline samples. The differences reflect natural variability in soil sample collection, as well as the fact that locations and depths were selected to focus on the three selected areas and to try to detect mass within the low conductivity silty clay unit. These data provide a better baseline for comparison with the Month 7 and Month 13 samples. The maximum TCE concentration was 70 mg/kg^{dry}, at 43.5 ft BLS at DPT0332, which is higher than baseline or otherwise previously measured in the area (refer to Section 4.3). Similar results were obtained for samples from 44.0 and 45.5 ft BLS at DPT0333.

In general, it appeared the PED was not present at the sampled locations. The PED, nBA, was only detected in a few locations, at very low concentrations. Minor amounts of nBuOH were

observed in a couple of samples. Nothing could be discerned about the possible partitioning of the nBA into TCE-NAPL.

Similar results were obtained at the end of the Main Recirculation Phase (Month 7), with maximum TCE concentration of 75 mg/kg^{dry} at DPT0348. Again spatial variability appeared to be more significant than changes due to operation of the DEM/VAL. At location DPT0346, the maximum TCE concentration declined from 70 to 4.8 mg/kg^{dry}, while at location DPT0348 the maximum TCE concentration increased from 31 to 75 mg/kg^{dry}, even with samples collected at the same depth. Similar results were obtained at the end of the Interim Measure Recirculation Phase (Month 13), with maximum TCE concentration of 75 mg/kg^{dry} at DPT0350. There was again considerable spatial variability.

Although it is admittedly a very crude approach, all of the results for each event were averaged together to develop an estimate of the mass of TCE and cDCE in soils at the locations sampled. There appears to be some decline in the amount of TCE detected over the course of the DEM/VAL, from the end of the Biomass Growth Phase to the end of the Main Recirculation Phase (Month 7) to the end of the Interim Measure Recirculation Phase (Month 13). Note that baseline is quite different because it represents a different set of locations. However, the analysis is not very robust, given the observed degree of spatial variability.

Average Soil Concentrations (mg/kg)

	TCE	cDCE
Baseline	3.60	2.35
Post Biomass Growth	21.27	2.89
Post Main Recirculation Phase (Month 7)	13.07	5.83
Post Interim Measure Recirculation Phase (Month 13)	10.23	5.70

E.2 TASK 2 – INITIAL BASELINE

Results from the Initial Baseline sampling event are compiled and presented in Tables E-1-5 (VOCs) and E-1-9 (Field Parameters) in Attachment E-1 of this Appendix. The VOC data is included in Figures 3, and 4 (main document) for the extraction wells and the corresponding figures in Attachments E-2 and E-3 for other locations. The results were incorporated into the interpolated TCE distribution presented in Figure 16 (main document). The laboratory reports from this sampling event are provided in Appendix G.

E.3 TASK 3 – BASELINE FLUX ASSESSMENT

Results from the Baseline Flux Assessment Phase sampling events are compiled and presented in Tables E-1-5 (VOCs), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-8 (Dissolved Metals), E-1-9 (Field Parameters) and E-1-10 (*Dhc* and *vcrA*) in Attachment E-1 of

this Appendix. The VOC data is plotted in Figures 1, 3, 4, and 20 (main document) and in the corresponding time-trend and VOC distribution plots included in Attachments E-2 and E-3. The laboratory reports from these sampling events are provided in Appendix G.

E.4 TASK 4 – INTRODUCTION OF PED AND TRACERS

Results from the batch QC sampling are compiled and presented in Table E-1-3 in Attachment E-1 of this Appendix.

The results from the confirmation DPT groundwater sampling are compiled and presented in Table E-1-4 in Attachment E-1 and an analysis of this data is presented in Table E-4-1 in Attachment E-4 of this Appendix. The laboratory reports are provided in Appendix G.

The results from the monitoring well confirmation sampling event are presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (Tracers) and E-1-9 (Field Parameters) in Attachment E-1; this data is also presented in Table E-4-2 in Attachment E-4, where tracer and PED data are presented together to assess recovery ratios. The results are plotted in Figures 1, 3, 4 and 20 of the main document for the extraction wells (and the corresponding figures in Attachments E-2 and E-3 for other wells). The laboratory reports are provided in Appendix G.

E.5 TASK 5 – BIOMASS GROWTH PHASE

Results from the Biomass Growth Phase sampling event are compiled and presented in Tables E-1-5 (VOCs, nBA and nBuOH), E-1-6 (DHGs, Anions and Tracers), E-1-7 (TOC, VFAs and nBA), E-1-8 (Dissolved Metals), and E-1-9 (Field Parameters) in Attachment E-1. The VOC data is plotted in Figures 1, 3, 4 and 20 (main document) for the extraction wells (and the corresponding time-trend and distribution figures in Attachments E-2 and E-3 for other wells). This data is used in the estimates of VOC mass remaining in the DEM/VAL treatment zone over the course of operations (refer to Section E.6.1 and Attachment E-6). The TOC and VFA data is also plotted in Figure 2 (main document). The laboratory reports from these sampling events are provided in Appendix G.

E.6 TASK 6 - GROUNDWATER SAMPLING RESULTS

Groundwater samples collected from the central extraction wells (RW0007 and RW0008) make up the primary data set, which includes field parameters, VOCs, nBA, nBuOH, DHGs, VFAs, alkalinity, anions, dissolved metals, and microbial characterization numbers. Additional data was collected during synoptic events from the entire monitoring well network.

All of the data collected for the DEM/VAL is tabulated in Attachment E-1 to this Appendix, including:

- Table E-1-3 Summary of PED Injectate Batch QC Sampling Results
- Table E-1-4 Summary of PED Injection Confirmation Grab Groundwater Sampling Results - PED, VOCs and Tracers
- Table E-1-5 Summary of Groundwater Sampling Results: Volatile Organic Compounds
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Attachment E-2 to this Appendix presents time-series plots of various analytes for each monitoring well location. For each monitoring location there is a set of four time-series plots, as follows:

- A) VOC data using molar concentrations;
- B) electron donor results, including nBA, nBuOH, VFA and TOC concentration data;
- C) bromide and iodide tracer concentrations through the end of the Main Recirculation Phase (these analytes were not part of the sample program in the Interim Measure Recirculation Phase); and
- D) several geochemical parameters, including methane, ethane, sulfate and sulfide concentrations.

Attachment E-3 to this Appendix presents the VOC distribution history for each monitoring well location in the form of a stacked bar chart, which shows how the total VOC concentrations varied over time as well as how the composition varied. These figures show the changes in total VOC concentration that were observed following PED addition.

Attachment E-4 to this Appendix presents several tables and figures used for data analysis. Attachment E-5 presents a summary of the results on a molar concentration basis, including tables and figures used in the analysis. Attachment E-6 presents estimates of the VOC mass remaining in the DEM/VAL treatment zone over the course of the demonstration.

E.6.1 VOC TRENDS

Groundwater samples were analyzed for a suite of VOCs, including TCE and its less-chlorinated breakdown products. These results were used to determine the baseline conditions in the test plots and assess the mass flux over time, including an evaluation of the extent of VOC dechlorination and identification of active degradation pathways. All VOC data collected from

the monitoring wells over the course of the DEM/VAL are presented in Table E-1-5 in Attachment E-1 to this Appendix. This data is also presented in several figures. Figure 3a (main document) presents the VOC data at RW0007 as a time-series, including the Initial Baseline and Baseline Flux Assessment results. Figure 3b (main document) presents the VOC data at RW0008 as a time-series. Time-series plots for other monitoring locations are shown in Attachment E-2 in this Appendix. Figures 1a and 20a (main document) show the VOC distribution history for RW0007, while Figures 1b and 20b show the VOC distribution history for RW0008. Attachment E-3 in this Appendix contains similar figures for the other monitoring locations.

Figure 4a and Figure 4b (main document) illustrate a quantitative analysis of the extent of dechlorination for RW0007 and RW0008, respectively. The extent of reductive dechlorination in a sample was characterized by calculating the fraction of chlorine removed from the equivalent concentration of TCE (calculated as the sum of the concentration of all chloroethenes and ethene) using the following equation, modified from Hood et al. (2008):

$$\text{Dechlorination Score (\%)} = \left(1 - \frac{3[TCE] + 2[cDCE] + 2[tDCE] + [VC]}{3([TCE] + [cDCE] + [tDCE] + [VC] + [ethene])}\right) \times 100$$

where the parentheses indicate molar concentrations and scores of 33%, 67% and 100% represent complete conversion to DCE, VC, and ethene, respectively. Whereas Hood et al. (2008) performed this calculation at a number of locations and presented summary statistics of the dechlorination scores for each sampling event, the values in Figures 4a and 4b are the results of singular analyses for RW0007 and RW0008, respectively, for each event.

The dissolved concentrations of TCE, cDCE and VC were used to estimate the mass of VOCs remaining in DEM/VAL treatment zones over the course of operations. The results are summarized in Attachment E-6. For each synoptic event, the average concentration of each VOC was determined in each of the three zones (upper, middle and lower) using all of the monitoring locations within each zone. Table E-6-1 presents the resulting average concentrations and corresponding mass estimates, calculated by multiplying the concentrations by the estimated groundwater volume in each zone. Estimates of the total mass including sorbed mass were made by calculating compound-specific partitioning coefficients within each zone assuming a linear sorption isotherm dependent on the fraction of organic carbon in the aquifer solids (i.e., $K_d = K_{ow} * f_{oc}$). The total VOC (TVOC) mass estimates are plotted in Figure E-6-1 (see Figure 21 of main document). Note that TVOC mass was estimated using compound mass concentrations rather than molar concentrations and hence are not directly comparable to TCE equivalents.

E.6.2 ELECTRON DONORS

Table E-1-7 in Attachment E-1 presents concentration data for the electron donor species, including nBA, nBuOH, TOC and VFAs. This data is plotted, in molar concentration units, in the ‘B’ series of figures in Attachment E-2.

In water, nBA can undergo hydrolysis to form nBuOH and acetic acid, both of which can be utilized as electron donors. Butanol is utilized by fermenting organisms to produce butyric acid, acetate and hydrogen. Based on post-injection samples, it appeared that a portion of the nBA was hydrolyzed relatively quickly following injection. Confirmation samples collected about a week after injection showed that significant concentrations of nBuOH had been formed (up to 520 mg/L, with an average concentration of 184 mg/L), representing on average 38% of the PED in these samples (Table E-4-2 in Attachment E-4). At the end of the Biomass Growth Phase, nBuOH was 84% of the total PED found (i.e. nBA plus nBuOH; Table E-4-3 in Appendix E).

Groundwater samples were analyzed for TOC at baseline as an indicator of the concentration of available organic carbon available naturally at the site. Following PED amendment, TOC served a gross indicator of the availability of electron donor in the subsurface. Groundwater samples were analyzed for VFAs to assess the presence of carbon substrates that can serve as electron donors during anaerobic biodegradation of VOCs. VFAs such as acetate can be produced by the metabolism of acetogenic microorganisms while growing on simple carbon compounds such as nBA. These organic acids can then serve as growth substrates and electron donors in VOC dechlorination reactions. Tables E-5-5 and E-5-10 in Attachment E-5, for RW0007 and RW0008, respectively, present the TOC and VFA data together for comparison, including plots that illustrate the mixture of carbon-containing compounds present over time. The TOC data correlated well with the more specific analyses, such as volatile fatty acids, demonstrating that this relatively inexpensive parameter could be used to monitor EISB performance in place of the more expensive, specific analyses, at least some of the time. Acetate and butanoate were the primary VFAs detected and the major components of the TOC. Even at the end of the Main Recirculation Phase, butanoate represented about 25% of the TOC at RW0007 (63% was acetate) and 6% of the TOC at RW0008 (84% was acetate). Persistence of butanoate, particularly in the upper zone, is a benefit of the nBA. The TOC and VFA data is presented in Figures 2a and 2b of the main document for RW0007 and RW0008, respectively.

E.6.3 TRACERS

Table E-1-6 in Attachment E-1 to this Appendix presents concentration data for the bromide and iodide tracers through the end of the Main Recirculation Phase (these analytes were not part of the sample program in the Interim Measure Recirculation Phase). The tracer results are plotted in the ‘c’ series of figures in Attachment E-2 to this Appendix.

No iodide was ever detected, above the method detection limit, in monitoring locations in the lower zone which infers that there was very little movement of fluid from the upper sweep zone to the lower sweep zone.

During PED Injection Confirmation sampling, some of the DPT grab samples were analyzed for the bromide and iodide tracers. The results are presented in Table E-1-4 in Attachment E-1 to this Appendix. A comparison of PED concentrations to the tracer concentrations was made. The measured concentrations of each were normalized to their respective concentrations in the injectate batches (refer to Table E-1-3). For the PED, the concentrations of nBA and nBuOH (as nBA equivalents) were combined when estimating nBA recovery. Bromide and iodide concentrations were used as measured, since baseline concentrations included a lot of non-detect values, making background correction difficult and prone to introduce errors. The results are presented in Table E-4-1 in Attachment E-4 to this Appendix. The average ratio of normalized nBA to normalized bromide concentration was 0.52, although if the three samples with nBA concentrations below 1,000 µg/L are omitted, the ratio is 0.69. This suggests that relatively less PED is recovered than bromide tracer. Although based on only three sample results, the ratio of normalized bromide to normalized iodide concentrations was about 2.2, suggesting bromide was over-recovered relative to iodide.

A similar analysis of PED concentrations relative to tracer concentrations was performed for samples collected from the monitoring well network on 07 July 2011, a week after PED injection, and on 01 August 2011, following the shut-in period (post-Biomass Growth Phase). The calculations are presented in Tables E-4-2 and E-4-3 in Attachment E-4 to this Appendix. On 07 July 2011, based on 11 samples, the average ratio of the normalized PED to normalized bromide concentration was 0.77, although the ratio of PED to bromide recovered in individual samples ranged from 0.06 to 1.49. On 01 August 2011, the same subset of wells had an average PED to bromide ratio of 0.53 (considering all wells, the ratio was 0.51).

The concentration of bromide in extraction well RW0007 was always higher than that from RW0008, on average by a factor of about 3 (refer to Table E-1-6). Part of the difference may come from the slightly different positions of each extraction well within the PED injected area, such that the capture zone of each might be expected to draw tracer amended fluids slightly differently. However, the greater sustained concentrations at RW0007 suggest that more bromide mass was introduced to the upper sweep zone than the lower.

The TOC and tracer data from each extraction well is plotted in Figure E-4-1 in Attachment E-4. The concentrations of TOC, bromide and iodide are normalized to their average concentrations in the injectate batches. Tracer data was only collected through the end of the Main Recirculation Phase and TOC was only measured quarterly beyond this. At RW0007, bromide was recovered in greater proportion than TOC and iodide. TOC is not expected to be conservative, but it is reasonable to expect bromide and iodide to behave similarly, since they were added together in all injection fluids in the upper zone. One possibility is that more

bromide was delivered to the upper zone than anticipated. This could have occurred if fluids injected into the silty clay or the lower aquifer flowed back along the DPT rods, since this injectate contained only bromide as a tracer. Although there was no indication of this at the time of injection, it would result in additional bromide and nBA being delivered to the upper zone. In the lower zone, at RW0008, the relative recoveries of TOC and bromide were quite similar. Since bromide and TOC (as nBA) were added in constant proportion during injection, any short-circuit flow to the upper zone that might have occurred during injection would affect the normalized concentrations of both equally. It would however result in lower than expected concentrations of both TOC and bromide.

Tracer recovery at the extraction wells is plotted in Figure E-4-2 in Attachment E-4. The tracer concentration data was combined with the extracted volume measurements to estimate the cumulative mass of tracer recovered in extracted groundwater. For the upper zone (RW0007) it is estimated that 11.6 kg of bromide were recovered, which is 3.0 times the bromide mass injected into the upper zone (3.9 kg). At the same time, an estimated 10.7 kg of iodide was recovered, which is 1.2 times the mass injected (9.0 kg). Note that the bromide recovery may have been somewhat higher: the bromide concentrations were background corrected by the average bromide concentrations (1.25 mg/L) observed during the Baseline Flux Assessment. With no background correction, the bromide mass recovered was 12.8 kg (3.3 times the bromide mass injected into the upper zone). In either case, the recovery of bromide was much greater than that of iodide, suggesting either that iodide was not conservative in the system or that extra bromide was introduced. An upper limit on the bromide introduced to the upper zone would be to consider the total mass added to the upper, middle and lower zones. The recovered bromide mass in the upper zone was actually 1.5 times (1.7 without background correction) the total bromide added to all zones (2.3 times the mass amended to the upper and middle zones), indicating that part of the difference is likely attributable to under-recovery of iodide.

For the lower zone (RW0008) it is estimated that 3.1 kg of bromide were recovered, which is 1.1 times the target bromide mass injected into the lower zone (2.7 kg). The ratio need not be the same as in the upper zone, since the actual pore volume of the sweep zones is not known for certain. However, as an experiment, if 40% of the bromide mass targeted to the lower zone is assigned to the upper zone, along with the mass targeted to the silty clay, then the ratio of recovered bromide mass to injected becomes 1.9 for both sweep zones.

Another way to look at the tracer recovery results is to look at when the cumulative mass extracted line crosses the mass added lines in Figure E-4-2 (Attachment E-4). For RW0007, the bromide mass extracted crosses the upper zone mass at about 60 kgal, and the bromide mass for the upper plus silt zones at about 80 kgal. In contrast, the iodide mass extracted line crosses the iodide mass added line at about 190 kgal. It appears that iodide may not have been conservative in the upper test plot.

Average tracer concentrations at the end of the Main Recirculation Phase can be used to estimate how much groundwater has been recirculated relative to the pore volume. This assumes concentrations at the extraction wells are representative of the average concentration throughout the pore volume. Using the mass of bromide injected to the upper zone (3.9 kg) and an average concentration of 7.9 mg/L, it is estimated that the bromide is distributed in a volume of 129.8 kgal. The total extracted volume in the upper zone at this point in operation was 243.4 kgal, which is a factor of 1.9 times greater. Hence, a rough estimate of the number of sweep zone pore volume replacements is 1.9, which is in agreement with the estimate based on area and depth (refer to Section C.4.1.1 in Appendix C). Note that if more bromide mass was actually delivered to the upper zone, then the calculated volume it is distributed throughout would be larger, and the estimated pore volume equivalents would be lower. Using iodide to make the same estimate, the estimated volume in which it is distributed is 316.2 kgal, which is much greater than that estimated using bromide, and yields only 0.77 pore volume equivalents. In the lower zone, the same approach (2.7 kg of bromide, average corrected bromide concentration of 2.8 mg/L) yields a distributed volume of 258.0 kgal, compared to the extracted volume of 221.6 kgal, which yields a ratio of 0.86 pore volume equivalents. The estimated volume containing tracer would be lower if the mass delivered to the lower zone was actually less than target, which would increase the estimated number of pore volume equivalents.

E.6.4 FIELD PARAMETERS

Table E-1-9 in Attachment E-1 to this Appendix presents the field parameter measurement results including pH, ORP, DO, specific conductivity, temperature, turbidity and total dissolved solids, which were measured and monitored for stability during groundwater sample collection to verify proper sampling techniques were followed and that samples were representative. Additionally, parameters such as pH, DO and ORP were used to characterize the prevailing geochemical conditions.

The pH was generally about 7.5, varying somewhat spatially and temporally, but without apparent trends. Average pH in the upper and lower zones was essentially the same. The average pH in the plot appeared to decline slightly at the Month 3 event, but then rose back again. The pH at extraction well RW0007 declined from around 7.5 to as low as 6.75 following nBA addition, gradually increasing again over the period of operation. Similarly, the pH at extraction well RW0008 declined to about 7.0 shortly after recirculation restarted, then gradually rose over the course of operation. Temporary decline in pH is consistent with fermentation of the amended PED.

The ORP was initially negative (average -169 mV in the upper zone and -146 mV in the lower zone), indicating reducing conditions existed prior to PED addition. Following PED injection, at Month 3, the average ORP dropped to -253 mV and -260 mV in the upper and lower zones, respectively. The upper zone ORP averaged -250 mV, -206 mV and -114 mV at Month 7, Month 10 and Month 13, respectively, indicating that the conditions became less reducing during

the Interim Measure Recirculation Phase. The lower zone ORP averaged -264 mV, -265 mV and -248 mV at Month 7, Month 10 and Month 13, respectively, indicating that reducing conditions below the silty clay were maintained throughout the Interim Measure Recirculation Phase.

DO levels were fairly similar throughout the DEM/VAL. The average concentrations were 0.38 mg/L and 0.27 mg/L in the upper and lower zones, respectively, at the end of the Baseline Flux Assessment Phase. The concentrations were similar throughout, until the final sampling event at the end of Month 13 when average DO concentrations were about 1.0 mg/L in both zones.

E.6.5 GEOCHEMICAL INDICATOR PARAMETERS

Table E-1-6 in Attachment E-1 to this Appendix presents the groundwater concentration data for alkalinity and selected anions (chloride, nitrate, nitrite, sulfate and sulfide) that were monitored to support the assessment of geochemical conditions. This table also contains data for the DHGs, including methane, ethane and ethene, as well as the tracer data for comparison. The methane and ethane data, as well as the sulfate and sulfide data for each monitoring location are plotted in the 'd' series of figures in Attachment E-2. Ethene is plotted with the chlorinated ethenes in the 'a' series of figures in Attachment E-2. Nitrate and nitrite were not detected in any of the samples collected.

Chloride is produced during reductive dechlorination reactions; hence increases in chloride concentration might indicate that biodegradation was occurring. However, the baseline chloride concentrations varied considerably with depth in the upper aquifer, and spatially at a given depth. For example, the chloride profile with depth can be assessed at the BW0001 location. At the end of the Baseline Flux Assessment, the chloride concentration in the upper zone increased with depth, from 84 mg/L in the upper interval (BW0001A), to 258 mg/L in the intermediate interval (BW0001B) and to 570 mg/L at the base of the upper aquifer (BW0001C). Even at a given depth, the chloride concentration was quite variable, with values of 570, 687 and 490 mg/L in the 37-40 ft interval (the BW000xC locations) and 642 mg/L at RW0007. Considering this amount of variability, it is not surprising that chloride production could not be confirmed with the data collected. It is noted that the chloride concentration at RW0007 showed a fairly steady decrease over the course of operation, from about 650 mg/L initially to about 400 mg/L at the end of recirculation. This is likely the result of gradual mixing of lower-chloride water from the upper aquifer with water from the base of the upper zone. Indeed, the average chloride concentration in the upper zone was 388 mg/L at the end of the Baseline Flux Phase (April 2011), decreased to 265 mg/L in Month 3 (October 2011), and decreased again, to 157 mg/L in Month 7 (February 2012). Chloride concentrations in the lower zone, including at RW0008, remained relatively constant over the course of the DEM/VAL, with average concentrations of 635, 644 and 604 mg/L at Baseline, Month 3 and Month 7, respectively.

Sulfate concentrations also varied, though not as much as the chloride. At the end of the Baseline Flux Assessment Phase (April 2011), the average sulfate concentration in the upper zone was 43 mg/L compared to 101 mg/L in the lower zone. At Month 3, the average sulfate concentrations had decreased, to 18 mg/L and 44 mg/L in the upper and lower zones, respectively. At Month 7, the average sulfate concentration in the upper zone increased somewhat, to 33 mg/L, while in the lower zone it further declined to 18 mg/L. The decreases in sulfate concentrations were more pronounced at the extraction wells. At RW0007 the sulfate concentration got as low as non-detect during the first three months of operation and then averaged about 3 mg/L for the next four months. At RW0008, sulfate was completely removed at the end of the Biomass Growth Phase (August 2011), rebounded slightly when recirculation re-started and then steadily decreased over the seven months of the Main Recirculation Phase. The decreases in sulfate concentrations were accompanied by increases in those of sulfide. The average concentrations of sulfide increased from non-detect levels initially, to 8 mg/L in both the upper and lower zones in Month 3, to 6 mg/L and 11 mg/L in the upper and lower zones, respectively in Month 7. These trends indicate that the reducing conditions created by the addition of the PED stimulated indigenous sulfate reducing bacteria. Reduction of sulfate to sulfide consumes electron donor but helps to establish suitable redox conditions for the reductive dechlorination process.

Alkalinity increased as a result of PED addition. Baseline alkalinity was 280 mg/L as CaCO₃ in the upper zone and 170 mg/L as CaCO₃ in the lower zone. At Month 3, the average alkalinity had increased to 500 mg/L in the upper zone and 250 mg/L in the lower zone. At Month 7, the average alkalinity was 360 mg/L and 270 mg/L in the upper and lower zones, respectively. Increased alkalinity is an indicator of microbial activity, since consumption of the applied PED results in production of bicarbonate.

Ethene was present in the groundwater in the upper zone at baseline, at an average concentration of 65 µg/L at the end of the Baseline Flux Assessment Phase (April 2011). However, no ethene was detected in the lower zone or middle silty clay unit. Following PED addition, ethene concentrations in both zones increased as it was produced by the dechlorination reactions. In the upper zone, the average ethene concentration increased over the first ten months of operation, first to 110 µg/L, then 140 µg/L and then 340 µg/L at the Month 3, Month 7 and Month 10 synoptic events, respectively. The average ethene concentration declined somewhat in the last quarter (Month 13), to 220 µg/L. In the lower zone, ethene concentrations also increased significantly over the course of system operation. Here the average concentrations were 50 µg/L, 230 µg/L, 520 µg/L and 570 µg/L for the Month 3, Month 7, Month 10 and Month 13 events, respectively. Ethene production confirmed that complete dechlorination of the parent VOCs (TCE, cDCE) through VC was occurring. Conversion to ethene contributes to the increased flux of VOCs, as can be seen in Figures 20a and 20b (main document) and Attachment E-3.

Ethane was not detected anywhere within the DEM/VAL plots initially, at the end of the Baseline Flux Assessment Phase (April 2011). Following PED addition, ethane was detected at many locations. At Month 3, the average ethane concentration in the upper zone was 25 µg/L, while in the lower zone it was 5 µg/L. The measured concentrations ranged from non-detect to 110 µg/L. This range and average concentration remained similar throughout the course of operation. Ethane is produced by the reduction of ethene, which is produced from dechlorination of TCE, cDCE and VC.

Methane was present in the groundwater from the beginning of the DEM/VAL, in the upper zone more so than the lower, with average baseline concentrations (end of Baseline Flux Assessment Phase) of 80 µg/L and 7 µg/L, respectively. Methane concentrations increased significantly over the course of system operation. In the upper zone, the average methane concentration increased over the first ten months of operation, first to 180 µg/L, then 290 µg/L and then 490 µg/L at the Month 3, Month 7 and Month 10 synoptic events, respectively. The average methane concentration declined somewhat in the last quarter (Month 13), to 280 µg/L. In the lower zone, methane concentrations also increased significantly over the course of system operation. Here the average concentrations were 390 µg/L, 330 µg/L, 830 µg/L and 1070 µg/L for the Month 3, Month 7, Month 10 and Month 13 events, respectively. The highest observed value was 5,800 µg/L, at IW0002D1 at the end of the shut-in period (Biomass Growth Phase). Methane production results from methanogens utilizing the reducing equivalents supplied by the electron donor, likely through acetate fermentation. These microorganisms produce methane as a metabolic product under anoxic conditions, generally after sulfate has been depleted. The methane concentrations suggest that suitably reducing conditions were maintained throughout the DEM/VAL.

E.6.6 METALS

Table E-1-8 in Attachment E-1 to this Appendix presents concentration data for dissolved Arsenic, Iron and Manganese over the course of the DEM/VAL. These species are known to be redox sensitive and are more mobile in their reduced forms. Concentrations were monitored to assess whether the reducing conditions created by PED addition had any effect on these species. Dissolved Arsenic was not detected. Dissolved Iron was observed at relatively low concentrations at a number of locations, although it was not detected in extracted groundwater from either zone after Week 8 (28 September 2011). Concentrations were generally at their highest at the end of the Biomass Growth Phase (01 August 2011), when conditions were likely most conducive to localized dissolution from aquifer solids, since it was one month after PED addition and prior to restarting groundwater recirculation. Dissolved Manganese was observed in most samples at low concentrations of 20 to 30 µg/L, which is below the FDEP GCTL of 50 µg/L. Manganese concentrations also generally showed peak values at the end of the Biomass Growth Phase and then returned to background levels.

E.6.7 MOLECULAR CHARACTERIZATION

Groundwater samples were analyzed for specific microbial genes linked to reductive dechlorination of chlorinated ethenes. The results are presented in Table E-1-10 in Attachment E-1 to this Appendix. Groundwater samples were analyzed via quantitative polymerase chain reaction (qPCR) analysis using the 16S rRNA gene (via the Gene-Trac-Dhc analysis offered by SiREM Laboratory [SiREM]). This analysis determined the presence and abundance of *Dhc* organisms, microbes that are capable of reductive dechlorination of chlorinated ethenes. A separate assay (SiREM's Gene-Trac-VC assay) using the qPCR method was used to quantify the *Dhc vcrA* gene, the gene that codes for vinyl chloride reductase, the enzyme responsible for dechlorination of cis-1,2-dichloroethene and vinyl chloride to ethene. Gene-Trac-VC characterizes the dechlorination capabilities of the detected *Dhc* organisms.

Six locations were monitored over the course of the DEM/VAL, three in the upper sweep zone (BW0001C, BW0003C and RW0007) and three in the lower sweep zone (BW0001E, BW0003E and RW0008). Initially, *Dhc* analyses were performed at all six locations, and *vcrA* was done only at the extraction wells (samples were archived for the other locations). Subsequently, during the Interim Measure Recirculation, the *vcrA* analysis was performed at all six locations.

The baseline samples collected at the end of the Baseline Flux Assessment (April 2011) confirmed that TCE-dechlorinating bacteria are native to the site; however, the number of *Dhc* organisms was relatively low. In the upper zone, the geometric mean of $1.5\text{E}+06$ gene copies/L suggested that microbial numbers were below the threshold level of $1.0\text{E}+07$ gene copies/L necessary to support 'generally useful' rates of dechlorination. In the lower zone, the numbers were considerably lower, with a geometric mean estimated to be $3.9\text{E}+03$ gene copies/L (using half the detection limit where not detected).

The Month 3 samples (October 2011) showed significant increases in *Dhc* numbers, to geometric mean values of $6.7\text{E}+07$ gene copies/L in the upper zone and $1.6\text{E}+07$ gene copies/L in the lower zone, increases of 44 and 4,100 times, respectively in response to PED addition. These *Dhc* numbers suggest that useful rates of dechlorination might be supported. Some locations (BW0001C, BW0001E and BW0003E) had not quite reached the threshold level; BW0003C never did reach it, despite a significant increase over baseline. The mean results for Month 7, Month 10 and Month 13 numbers were similar to Month 3 for both the upper and lower sweep zones, indicating that the microbial population was sustained by the electron donors available with the plots.

The *vcrA* results confirm that the detected *Dhc* was capable of degrading vinyl chloride to ethene efficiently. The data from the extraction wells indicates that initially the *vcrA* component made up only about 5% of the *Dhc*, but that over the course of operation the proportion of *Dhc* that contained the *vcrA* component grew to be essentially 100%. This suggests that by Month 10 the

entire *Dhc* microbial population had the capability of degrading vinyl chloride to ethene efficiently.

E.7 ATTACHMENTS

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Attachment E-3	Distribution of VOCs by Well (Stacked Bar Charts)
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ATTACHMENT E-1
DATA SUMMARY TABLES

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**Table E-1-1. Summary of Soil Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Event	Location	Sample Date	Sample Depth (ft BLS)	Trichloroethene (mg/kg)*	cis-1,2-Dichloroethene (mg/kg)*	trans-1,2-Dichloroethene (mg/kg)*	Vinyl Chloride (mg/kg)*	n-Butyl Acetate (mg/kg)*	n-Butanol (mg/kg)*
Baseline	LC34-SB1001	01/19/2011	24.0	0.02	1.4 L	0.03	0.05	0.05 U	NA
			35.5	3.2	2.0	0.10 U	0.10 U	0.50 U	NA
			41.0	2.6	4.2	0.10 U	0.10 U	0.50 U	NA
			44.5	5.7	1.4	0.10 U	0.10 U	0.50 U	NA
	LC34-SB1002	01/19/2011	44.5	0.01 U	0.06	0.01 U	0.01 U	0.05 U	NA
			46.5	0.03	0.55	0.01 U	0.01 U	0.05 U	NA
			49.5	0.01 U	0.02	0.01 U	0.01 U	0.05 U	NA
			55.0	0.01 U	0.01 U	0.01 U	0.01 U	0.05 U	NA
	LC34-SB1003	01/19/2011	37.5	3.7	7.0	0.10 U	0.10 U	0.50 U	NA
			43.0	7.3	0.36 I	0.50 U	0.50 U	2.5 U	NA
			44.0	22	0.76	0.50 U	0.50 U	2.5 U	NA
			46.0	6.8	1.1	0.10 U	0.10 U	0.50 U	NA
			49.5	7.2	2.0	0.10 U	0.10 U	0.50 U	NA
	LC34-SB1004	01/19/2011	34.5	0.77	2.0	0.10	0.05 I	0.50 U	NA
			37.0	0.50 U	15	0.50 U	0.22 I	2.5 U	NA
			43.0	3.4	0.98	0.10 U	0.10 U	0.50 U	NA
			45.0	5.4	3.8	0.10 U	0.10 U	0.50 U	NA
			46.5	0.35	2.0	0.10 U	0.10 U	0.50 U	NA
			50.0	0.01 U	0.02	0.01 U	0.01 U	0.05 U	NA
	Post Biomass Growth	LC34-DPT0332	08/03/2011	37.0	15	6.8	0.055 I	0.160 I	8.3
43.5				70	4.5	0.11 U	0.13 U	38	36 I
45.0				3.4	1.8	0.04 U	0.048 U	7.7	9.6 I
48.0				1.8	1.5	0.037 U	0.046 U	1.1	2.5 U
53.0				0.0098	0.0042 I	0.00042 U	0.00052 U	0.0047 I	0.013 U
LC34-DPT0333		08/03/2011	37.0	46	6.5	0.083 I	0.075 U	24	33 I
			44.0	65	1.1 I	0.24 U	0.29 U	6.4	7.2 U
			45.5	64	3.3	0.064 I	0.062 U	4.9	11 I
			47.0	37	2	0.049 U	0.059 U	0.29 I	16 I
			48.5	5.7 L	0.73 L	0.0042 I	0.0015 I	0.16	14 L
			53.0	0.0095	0.002 I	0.00044 U	0.00054 U	0.00087 I	0.014 U
LC34-DPT0334		08/03/2011	34.5	4.8	2.7	0.05 I	0.033 U	0.490 I	3.7 I
			37.0	6.8	7.1	0.042 I	0.3 I	0.057 I	64
			45.5	5.7 L	4.0 L	0.078	0.0028 I	1.7 L	5.7
			47.0	31	5.7	0.093 I	0.065 U	0.056 I	3.6 U
			48.5	5.3	1.4	0.034 U	0.041 U	0.03 U	2.3 U
			53.0	0.006 I	0.003	0.00032 U	0.00039 U	7.0	0.40

**Table E-1-1. Summary of Soil Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Event	Location	Sample Date	Sample Depth (ft BLS)	Trichloroethene (mg/kg)*	cis-1,2-Dichloroethene (mg/kg)*	trans-1,2-Dichloroethene (mg/kg)*	Vinyl Chloride (mg/kg)*	n-Butyl Acetate (mg/kg)*	n-Butanol (mg/kg)*
End of Main Recirculation Phase (Month 7)	LC34-DPT0346	02/13/2012	37.0	0.620 I	6.1	0.099 I	1.7	0.032 U	2.5 U
			40.0	0.420 I	14	0.34 I	0.67 I	0.071 U	5.5 U
			43.5	4.9	6.3	0.053 I	1.6	0.038 U	3 U
			45.0	4.3	6.2	0.071 U	1.7	0.0062 U	4.8 U
			46.5	0.0024 I	0.0075	0.00089 I	0.0065	0.00087 I	0.012 U
			48.0	8	23	0.13 I	0.11 I	0.043 U	3.3 U
			53.0	0.00063 U	0.00059 I	0.00077 I	0.0098	0.00056 U	0.015 U
	55.0	0.0005 U	0.001 I	0.0006 I	0.0033 I	0.00044 U	0.012 U		
	LC34-DPT0347	02/13/2012	37.0	4.4	0.84	0.034 U	0.85	0.029 U	2.3 U
			40.0	2.6	0.68	0.030 U	0.69	0.026 U	2 U
			45.5	0.17	0.13	0.0023 I	0.022	0.0011 I	0.013 U
			47.0	73	7.5	0.12 U	0.17 I	0.11 U	7.8 U
			50.0	69	3.6 I	0.17 U	0.21 U	0.15 U	12 U
			50.5	0.0016 I	0.0017 I	0.00042 U	0.013	0.00049 U	0.013 U
	53.0	0.0016 I	0.0014 I	0.00052 I	0.012	0.00047 U	0.012 U		
	LC34-DPT0348	02/13/2012	34.5	0.062 I	5.8	0.12 I	0.29 I	0.026 U	2 U
			37.0	0.030 I	0.26 I	0.052 I	3.7	0.023 U	1.8 U
			40.0	0.670 I	2.5	0.033 U	0.9	0.028 U	2.2 U
			45.4 [‡]	0.19	0.031	0.00062 U	0.00091 I	0.0025 I	0.026 I
			45.5 [‡]	0.160 I	0.56 I	0.056 U	0.59 I	0.067 U	1.7 U
			45.6 [‡]	3.4 L	1.3 L	0.014	0.39 L	0.0011 I	0.014 U
47.0			41	23	0.27 I	0.14 U	0.098 U	7.6 U	
48.5			75	27	0.24 I	0.093 U	0.067 U	5.2 U	
53.0	0.001 I	0.0039 I	0.00041 U	0.0032 I	0.00071 I	0.013 U			

**Table E-1-1. Summary of Soil Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Event	Location	Sample Date	Sample Depth (ft BLS)	Trichloroethene (mg/kg)*	cis-1,2-Dichloroethene (mg/kg)*	trans-1,2-Dichloroethene (mg/kg)*	Vinyl Chloride (mg/kg)*	n-Butyl Acetate (mg/kg)*	n-Butanol (mg/kg)*
End of Interim Measure Recirculation Phase (Month 13)	LC34-DPT0349	09/10/2012	37.0	2.9	7.2	0.16 I	1.7	0.047 U	11 U
			40.0	0.11 I	0.67 I	0.057 U	0.73 I	0.035 U	7.5 U
			43.5	1.5	1.2	0.042 U	1.3	0.026 U	5.5 U
			45.0	1.5	3.7	0.074 I	2.1	0.029 U	6.3 U
			46.5	30	11	0.09 U	0.2 I	0.055 U	12 U
			47.0	10	14	0.061 I	0.17 I	0.029 U	6.2 U
			48.0	0.59 I	19	0.092 I	0.19 I	0.029 U	6.2 U
			53.0	0.0018 I	0.0025 I	0.0016 I	0.067	0.00091 U	0.058 U
	LC34-DPT0350	09/10/2012	37.0	5.0	4.2	0.11 I	2.1	0.026 U	5.5 U
			40.0	1.1	0.7	0.047 U	0.96	0.028 U	6.1 U
			44.0	4.8	3.3	0.07 I	2.2	0.033 U	7.1 U
			45.5	75	2.7	0.17 U	0.14 U	0.11 U	22 U
			47.0	48	5.1	0.11 U	0.092 U	0.066 U	15 U
			48.5	38	4.7	0.12 U	0.094 U	0.067 U	15 U
			53.0	0.0049 I	0.0072	0.00095 U	0.011	0.00091 U	0.058 U
	LC34-DPT0351	09/10/2012	34.5	0.021 U	0.9	0.04 U	0.05 I	0.024 U	5.2 U
			37.0	0.01	0.03	0.03	0.65	0.00067 U	0.043 U
			40.0	0.01	0.1	0.043	0.033	0.00085 U	0.054 U
			45.5	6.4	8.9	0.061 I	1.2	0.03 U	6.4 U
			47.0	0.12 I	21	0.094 I	0.61 I	0.049 U	11 U
			48.5	0.13 I	17	0.079 I	1.3	0.04 U	8.6 U
53.0	0.0009 U	0.0015	0.00077 U	0.0027 I	0.00078 I	0.047 U			

Notes:

1. ft BLS indicates feet below land surface.
2. mg/kg indicates milligrams per kilogram.
3. U indicates result not detected above method detection limit (MDL).
4. I indicates the result is between the MDL and the practical quantitation limit.
5. L indicates concentration exceeded upper limit of calibration range, estimated value.
6. NA indicates not analyzed.
7. **Bold** indicates the result was detected above method detection limit (MDL).
8. Results not displayed to a set number of significant digits.

† The results from analysis of three sample aliquots are reported using slightly different sample depths for the same sample.

* Baseline sample data is from a mobile laboratory and is reported on a wet weight basis. All other data is from a fixed laboratory and is reported on a dry weight basis.

Table E-1-2. Summary of Soil Sampling Results: Baseline Organic Carbon Content
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Sample Depth (ft BLS)	Total Organic Carbon (mg/kg)	Fraction Organic Carbon
LC34-SB1002	01/19/2011	28	1,110	0.00111
LC34-SB1002	01/19/2011	34	990	0.00099
LC34-SB1002	01/19/2011	47	2,630	0.00263
LC34-SB1002	01/19/2011	53	860	0.00086
LC34-SB1003	01/19/2011	28	1,410	0.00141
LC34-SB1003	01/19/2011	34	440	0.00044
LC34-SB1003	01/19/2011	47	3,070	0.00307
LC34-SB1003	01/19/2011	53	650	0.00065

Notes:

1. ft BLS indicates feet below land surface.
2. mg/kg indicates milligram per kilogram.
3. **Bold** indicates the result was detected above method detection limit (MDL).
4. Results not displayed to a set number of significant digits.

**Table E-1-3. Summary of PED Injectate Batch QC Sampling Results
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Bromide (mg/L)	Iodide (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	Concentration Ratios		
						nBA/Br	nBA/I	Br/I
BATCH 10	06/21/2011	65	NA	2,500,000	210,000 U	38	--	--
BATCH 17	06/21/2011	111	70	1,900,000	110,000 U	17	27	1.6
BATCH 26	06/21/2011	109	150	2,200,000	210,000 U	20	15	0.7
BATCH 29	06/22/2011	71	NA	2,500,000	210,000 U	35	--	--
BATCH 39	06/22/2011	88	NA	7,700,000	530,000 U	87	--	--
BATCH 40	06/22/2011	86	115	4,700,000	270,000 U	54	41	0.8
BATCH 49	06/22/2011	72	146	6,600,000	530,000 U	91	45	0.5
BATCH 54	06/23/2011	65	NA	3,400,000	270,000 U	52	--	--
BATCH 57	06/23/2011	65	NA	2,400,000	210,000 U	37	--	--
BATCH 67	06/23/2011	71	102	1,700,000	500,000 U	24	17	0.7
BATCH 112	06/27/2011	76	100	3,800,000	270,000 U	50	38	0.8
BATCH 117	06/27/2011	69	145	1,800,000	110,000 U	26	12	0.5
BATCH 127	06/27/2011	68	NA	1,100,000	110,000 U	16	--	--
BATCH 134	06/27/2011	69	NA	2,300,000	210,000 U	34	--	--
BATCH 136	06/28/2011	63	105	2,500,000	110,000 U	39	24	0.6
BATCH 144	06/28/2011	17	27	1,800,000	110,000 U	107	67	0.6
BATCH 152	06/28/2011	64	NA	2,100,000	210,000 U	33	--	--
Targets		60	140	3,000,000	0	50	21.4	0.43
Upper Zone Batches (Br & I)	average	75	107	3,000,000	--	48	32	0.75
	std dev	28	40	1,701,470	--	32	18	0.33
Lower Zone Batches (Br)	average	69	--	3,000,000	--	42	--	--
	std dev	8	--	2,000,714	--	21	--	--
Overall	average	72	--	3,000,000	--	45	--	--
	std dev	21	--	1,788,505	--	27	--	--

Notes:

1. mg/L indicates milligrams per liter.
2. µg/L indicates micrograms per liter.
3. nBA/Br is the ratio of n-Butyl Acetate to Bromide
4. nBA/I is the ratio of n-Butyl Acetate to Iodide
5. Br/I is the ratio of Bromide to Iodide
6. U indicates result not detected above method detection limit (MDL).
7. NA indicates not analyzed.
8. -- indicates not applicable
9. **Bold** indicates the result was detected above method detection limit (MDL).
10. Results not displayed to a set number of significant digits.

Table E-1-4. Summary of PED Injection Confirmation Grab Groundwater Sampling Results - PED, VOCs and Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Sample interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)	Bromide (mg/L)	Iodide (mg/L)
LC34-DPT0328	06/30/2011	28 to 32	4,100	45,000	500 I	240 U,I	1,500 J	NA	1,000 U	NA	NA
	06/30/2011*		3,800	48,000	440 I	250 I	110 U	25,000 U	160 U	0.30 U	0.20 U
	06/30/2011	37 to 41	1,400	52,000	330 I	1,600	19,000	NA	1,000 U	NA	NA
	06/30/2011*		1,200 I	56,000	260 I	2,000 I	15,000	25,000 U	160 U	2.0	0.20 U
	06/30/2011	43 to 47	2,100	34,000	210 I	120 U,I	640 J	NA	500 U	NA	NA
	06/30/2011*		1,900	35,000	190 I	58 U	55 I	13,000 U	78 U	1.9	0.20 U
	06/30/2011	49 to 53	4.5 I	250	10 U	4.4 I	26 J	NA	10 U	NA	NA
	06/30/2011*		NA	NA	NA	NA	NA	NA	NA	1.8	0.20 U
	06/30/2011	55 to 59	1.3	64.8	1.0 U	1.0 U	440	NA	1.0 U	NA	NA
	6/30/2011*		NA	NA	NA	NA	NA	NA	NA	1.9	0.20 U
LC34-DPT0329	06/30/2011	28 to 32	2,900 U,I	4,800 I	10,000 U	2,400 U,I	1,300,000	NA	18,000	NA	NA
	06/30/2011	37 to 41	11,000	11,000	1,000 U	240 U,I	1,200,000	NA	1,400	NA	NA
	06/30/2011*		10,000 I	14,000 I	2,000 U	2,300 U	1,100,000	500,000 U	3,100 U	50	25
	06/30/2011	43 to 47	34,000	4,900	2,000 U	480 U,I	1,300,000	NA	5,000	NA	NA
	06/30/2011*		NA	NA	NA	NA	NA	NA	NA	46	0.20 U
	06/30/2011	49 to 53	9,000	5,000 U	5,000 U	1,200 U,I	1,700,000	NA	4,100 I	NA	NA
LC34-DPT0330	06/30/2011	8 to 12	3.8 I	230	7.0	12	1,600	NA	5.0 U	NA	NA
	06/30/2011	28 to 32	1,700	38,000	510	240 I	19,000	NA	500 U	NA	NA
	06/30/2011	37 to 41	640	50,000	290 I	2,300	20,000	NA	500 U	NA	NA
	06/30/2011*		530 I	59,000	340 I	2,500	15,000	25,000 U	160 U	2.5	0.20 U
	06/30/2011	43 to 47	3,800	20,000	2,000 U	480 U,I	860,000	NA	2,000 U	NA	NA
	06/30/2011*		3,500	20,000	130 I	120 U	690,000	75,000	160 U	28	0.20 U
	06/30/2011	49 to 53	58 U,I	1,200	200 U	48 U,I	97,000	NA	200 U	NA	NA
	06/30/2011*		58 U	510 I	50 U	58 U	76,000	19,000	78 U	4.2	0.20 U
LC34-DPT0331	06/30/2011	14 to 18	58 U,I	14,000	390	1,000	1,700	NA	18,000	NA	NA
	6/30/2011*	28 to 32	NA	NA	NA	NA	NA	NA	NA	0.30 U	NA
	06/30/2011		24,000	15,000	2,000 U	960 I	24,000	NA	180,000	NA	NA
	6/30/2011*	37 to 41	NA	NA	NA	NA	NA	NA	NA	1.8	2.8
	06/30/2011		72,000	20,000	1,000 U	240 U,I	490,000	NA	44,000	NA	NA
	06/30/2011*	43 to 47	76,000	20,000	500 U	580 U	360,000	27,000 U	50,000	6.2	3.6
	06/30/2011		190,000	4,700	2,000 U	480 U,I	55,000	NA	68,000	NA	NA
	06/30/2011*		180,000	3,700 I	200 U	230 U	820 I	50,000 U	56,000	1.7	0.20 U

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. * indicates duplicate sample.
4. For primary samples U indicates result not detected above practical quantitation limit (PQL), for duplicate samples U indicates result not detected above method detection limit (MDL).
5. I indicates the result is between the MDL and the practical quantitation limit (PQL).
6. J indicates an estimated value; for primary samples, n-Butyl Acetate values below PQL are qualified with J.
7. NA indicates not analyzed.
8. **Bold** indicates the result was detected above method detection limit (MDL).
9. Results not displayed to a set number of significant digits.
10. Primary sample results from mobile lab (KB Labs); not certified for n-Butyl Acetate and 1,1,2-Trichlorotrifluoroethane, data should be considered screening level.

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-BW0001A	02/01/2011	23 to 26	300 I	31,000	640	4,700	30 U	670 U	120,000
	04/18/2011		150 U	39,000	830 I	2,200 I	150 U	3,400 U	65,000
	08/01/2011		300 I	36,000	690 I	4,000	340 I	5,300 U	87,000 J
	08/01/2011*		470 I	39,000	680 I	5,200	670 I	49,000 I	120,000 J
	10/25/2011		130 I	45,000	1,100 I	2,400	53 U	2,700 U	59,000
	02/16/2012		120 U	11,000	290 I	840 I	110 U	5,300 U	93,000
	06/26/2012		120 U	6,200	220 I	770 I	110 U	5,300 U	50,000
09/13/2012	500 U	1,700	60 I	200 I	39 U	1,800 U	20,000		
LC34-BW0001B	02/01/2011	30 to 33	27,000	6,600	150 I	160 I	60 U	1,400 U	130,000
	04/18/2011		14,000	28,000	470 I	1,800 I	300 U	6,700 U	150,000
	08/01/2011		19,000	14,000	270 I	600 I	1,000 I	11,000 U	140,000
	10/25/2011		3,200	12,000	260 I	1,100 I	56,000	1,400,000	68,000
	02/16/2012		1,400 I	38,000	920 I	2,200 I	210 U	11,000 U	150,000
	06/26/2012		720 I	28,000	750 I	1,500 I	210 U	11,000 U	160,000
	09/13/2012		350 I	19,000	510 I	1,100 I	98 U	4,400 U	98,000
LC34-BW0001C	02/01/2011	37 to 40	53,000	47,000	280 I	150 U	150 U	3,400 U	1,600 I
	03/22/2011		48,000	28,000	240 I	420 I	75 U	1,700 U	26,000
	03/29/2011		48,000	26,000	290 I	380 I	60 U	1,400 U	60,000
	04/07/2011		54,000	29,000	280 I	570 I	75 U	1,700 U	55,000
	04/18/2011		45,000	25,000	260 I	630 I	150 U	3,400 U	59,000
	07/07/2011		52,000	21,000	270 I	510 I	420,000	320,000	19,000
	08/01/2011		27,000	31,000	210 I	480 I	95,000	280,000	14,000
	10/25/2011		12,000	22,000	270 I	1,300 I	110 U	200,000	98,000
	02/16/2012		1,400	26,000	390 I	3,700	53 U	2,700 U	45,000
	06/26/2012		370 I	22,000	460 I	3,800	53 U	2,700 U	67,000
09/13/2012	130 I	20,000	420 I	1,900	98 U	4,400 U	47,000		
LC34-BW0001D	02/01/2011	44 to 47	150,000	5,200	150 U	150 U	150 U	3,400 U	43,000
	04/18/2011		180,000	6,100	300 U	300 U	300 U	6,700 U	55,000
	07/07/2011		170,000	5,600	200 U	230 U	60,000	23,000 I	39,000
	08/01/2011		120,000 J	4,300 IJ	200 U	230 U	71,000	15,000 I	32,000
	08/01/2011*		170,000 J	5,900 J	200 U	230 U	84,000	22,000 I	39,000
	10/25/2011		150,000	3,000 I	200 U	230 U	270,000	310,000	63,000
	02/16/2012		110,000	5,100	200 U	230 U	210 U	36,000 I	69,000
	06/26/2012		64,000	7,400	200 U	990 I	210 U	11,000 U	140,000
09/13/2012	43,000	12,000	170 U	990 I	200 U	8,700 U	83,000		

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-BW0001E	02/01/2011	51 to 54	1,600	220	3 U	3 U	3 U	67 U	4 U
	03/22/2011		590	79	1.5 U	1.5 U	1.5 U	34 U	2 U
	03/29/2011		400	71	0.75 U	0.83 I	0.75 U	17 U	1.5 I
	04/07/2011		380	60	0.75 U	0.75 U	0.75 U	17 U	1 I
	04/18/2011		490	74	0.6 U	0.86 I	0.6 U	14 U	1.6 I
	07/07/2011		330	1,500	11 I	4.7 U	3,500	1,500 I	6.2 U
	08/01/2011		32 I	1,400	8.9 I	23 I	4.6 I	730 I,V	3.5 I
	10/25/2011		230	470	3.6 I	110	1.1 U	53 U	110
	02/16/2012		1.2 I	2.5 I	1 I	27	0.21 U	11 U	1.4 I
	06/26/2012		0.5 I	59	12	600	0.21 U	11 U	5.6
09/13/2012	2.4 I	13	2.5 I	23	0.98 U	44 U	460		
LC34-BW0001F	02/01/2011	58 to 61	3.5 I	0.79 I	0.3 U	0.3 U	0.3 U	6.7 U	0.79 I
	04/18/2011		1.1 I	0.41 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	08/01/2011		1,200 U	1,000 U	1,000 U	1,200 U	900,000	620,000 I,V	1,600 U
	10/25/2011		1.1 I	0.34 I	0.2 U	0.23 U	0.21 U	150 I	0.31 U
	02/16/2012		5.1	53	0.2 U	81	0.21 U	11 U	3.3 I
	06/26/2012		1.2 I	0.99 I	0.2 U	13	0.21 U	11 U	0.31 I
	09/13/2012		1.4 I	0.50 I	0.33 U	3.8 I	0.4 I	18 U	0.71 I
LC34-BW0002A	02/01/2011	23 to 26	530 I	36,000	690 I	110 I	60 U	1,400 U	67,000
	04/19/2011		140 I	41,000	820 I	1,900	75 U	1,700 U	11,000
	04/19/2011*		140 I	38,000	790 I	1,800	75 U	1,700 U	9,800
	08/02/2011		300 I	32,000	610 I	820 I	150 I	11,000 I	23,000
	10/26/2011		31 I	13,000	330 I	850	21 U	1,100 U	1,100
	02/15/2012		51 I	46,000	380 I	7,800	21 U	1,100 U	31 U
	06/26/2012		4.7 I	260	34	410	0.53 U	27 U	210
	09/11/2012		5.6	49	13	130	0.39 U	18 U	60
LC34-BW0002B	02/01/2011	30 to 33	17,000	44,000	390 I	230 I	75 U	1,700 U	230 I
	04/19/2011		1,100 I	48,000	850 I	750 I	75 U	1,700 U	24,000
	08/02/2011		2,500	42,000	580 I	470 I	130 I	2,700 U	1,100 I
	10/26/2011		320 I	36,000	720 I	1,300	53 U	2,700 U	5,400
	02/15/2012		41 I	4,900	170	1,800	5.3 U	270 U	130
	06/26/2012		16 I	1,100	67	820	2.1 U	110 U	130
	09/11/2012		9.8 I	170	23	330	0.98 U	44 U	36

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-BW0002C	02/01/2011	37 to 40	620 I	87,000	510 I	700 I	75 U	1,700 U	100 U
	03/22/2011		2,900	66,000	430 I	2,500	75 U	1,700 U	100 U
	03/29/2011		5,300	75,000	460 I	2,300 I	150 U	3,400 U	200 U
	04/07/2011		3,000	79,000	450 I	2,300 I	150 U	3,400 U	200 U
	04/19/2011		1,800 I	74,000	490 I	2,100 I	150 U	3,400 U	200 U
	07/07/2011		2,000 I	51,000	360 I	2,200 I	490,000	120,000 I	310 U
	08/02/2011		380 I	43,000	280 I	6,100 J	42,000	210,000	78 U
	10/26/2011		530 I	66,000	320 I	3,800	53 U	2,700 U	400 I
	02/14/2012		2.1 I	580	54	620	1.1 U	53 U	44
	06/26/2012		5.7 I	30,000	250	13,000	1.1 U	53 U	5.7 I
09/11/2012	22 U	11,000	280 I	11,000	39 U	1,800 U	31 U		
LC34-BW0002D	02/01/2011	44 to 47	39 I	4,200	29 I	52 I	7.5 U	170 U	10 U
	04/19/2011		38 I	7,500	49 I	410 J	7.5 U	170 U	10 U
	04/19/2011*		44 I	7,900 Q	49 I	360 J	7.5 U	170 U	10 U
	07/07/2011		41 I	8,000	58 I	1,300	49 I	530 U	16 U
	08/02/2011		43 I	8,800	59 I	1,500	86 I	530 U	16 U
	08/02/2011*		41 I	8,100	63 I	1,100	81 I	4,300 I	16 U
	10/26/2011		29 I	16,000	110 I	3,900	11 U	530 U	16 U
	02/14/2012		29 I	13,000	120 I	6,500	21 U	1,100 U	52 I
	06/26/2012		23 U	5,100	110 I	12,000	21 U	1,100 U	37 I
09/11/2012	11 U	40 I	79 I	9,100	20 U	870 U	16 U		
LC34-BW0002E	02/01/2011	51 to 54	0.78 I	9.3	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/19/2011		0.64 I	19	0.3 U	2 I	0.3 U	6.7 U	0.55 I
	07/07/2011		4.7 U	62 I	4 U	4.7 U	3,300	2,000 I	6.2 U
	08/02/2011		1.3 I	51	0.29 I	3.4 I	43	150 I	0.31 U
	10/26/2011		0.35 I	15	0.64 I	69	0.21 U	11 U	0.4 I
	02/14/2012		0.23 U	2.3 I	0.62 I	22	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.71 I	0.75 I	15	0.21 U	11 U	0.31 U
	09/11/2012		2.6 I	8.1	1.2 I	23	0.39 U	18 U	0.37 I
LC34-BW0002F	02/01/2011	58 to 61	10 I	880	5.0 I	28	1.5 U	34 U	2 U
	04/19/2011		4.7 I	80 J	2.1 I	67 J	0.3 U	6.7 U	0.4 U
	04/19/2011*		5.3	58 J	1.4 I	38 J	0.3 U	6.7 U	0.4 U
	08/02/2011		5.1 J	150 J	4.6 I	440	0.41 I	11 U	0.31 U
	08/02/2011*		2.1 IJ	100 J	2.7 I	370	0.53 U	27 U	0.78 U
	10/26/2011		0.5 I	8.2	0.63 I	35	0.21 U	11 U	0.31 U
	02/14/2012		0.23 U	0.84 I	0.4 I	6.3	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	1.6 I	4.6 I	160	0.21 U	11 U	0.31 U
09/11/2012	6.4	40	5.1	130	0.39 U	18 U	0.81 I		

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-BW0003A	02/01/2011	23 to 26	60 U	37,000	60 U	13,000	60 U	1,400 U	80 U
	04/19/2011		60 U	45,000	970 I	5,700	60 U	1,400 U	1,700
	08/02/2011		58 U	33,000	760 I	12,000	53 U	2,700 U	78 U
	10/26/2011		58 U	30,000	790 I	2,100	53 U	2,700 U	150 I
	02/15/2012		12 U	6,800	220 I	1,100	11 U	530 U	16 U
	06/27/2012		12 U	5,200	220 I	560	11 U	530 U	2,500
	09/11/2012		2.4 I	1,600	55	210	4 U	180 U	690
LC34-BW0003B	02/01/2011	30 to 33	30 U	16,000	30 U	5,300	30 U	670 U	40 U
	04/19/2011		30 U	46,000	600 J	5,500 J	30 U	670 U	96 I
	04/19/2011*		30 U	52,000	1,000 J	9,500 J	30 U	670 U	220 I
	08/02/2011		23 U	6,700	310 I	14,000	88 I	1,100 U	31 U
	10/27/2011		120 U	48,000	1,300 I	6,900	110 U	5,300 U	160 U
	02/15/2012		12 U	8,600	360	1,900	11 U	530 U	31 I
	06/27/2012		12 U	6,600	270	1,000	11 U	530 U	190 I
	09/11/2012		4.4 U	2,100	82 I	350	7.9 U	350 U	490
LC34-BW0003C	02/02/2011	37 to 40	140 I	36,000	240 I	2,900	30 U	670 U	40 U
	03/22/2011		65 I	12,000	110 I	3,200	30 U	670 U	40 U
	03/29/2011		36 I	12,000	160 I	3,500	30 U	670 U	40 U
	04/07/2011		32 I	9,800	150 I	4,700	15 U	340 U	20 U
	04/19/2011		15 U	6,000	120 I	4,500	15 U	340 U	20 U
	07/07/2011		230 U	4,300 I	200 U	2,400 I	640,000	360,000	310 U
	08/02/2011		21 I	2,500	67 I	3,100	290	190,000	7.8 U
	10/27/2011		12 U	1,800	180 I	9,400	11 U	530 U	23 I
	02/15/2012		12 U	16,000	600	14,000	11 U	530 U	16 U
	06/27/2012		23 U	22,000	840	8,600	21 U	1,100 U	31 U
09/13/2012	22 U	17,000	560	5,100	39 U	1,800 U	31 U		
LC34-BW0003D	02/02/2011	44 to 47	7,800	17,000	79 I	410 I	30 U	670 U	220 I
	04/19/2011		650	6,800	33 I	400	15 U	340 U	20 U
	04/19/2011*		500	5,700	27 I	340	15 U	340 U	20 U
	07/07/2011		1,300 I	7,700	200 U	400 I	830,000	350,000	420 I
	08/02/2011		1,100 I	7,500	200 U	740 I	170,000	510,000	430 I
	10/26/2011		96 I	3,500	27 I	1,900	6.5 I	270 U	410
	02/15/2012		28 I	3,200	51 I	2,900	5.3 U	270 U	590
	06/27/2012		5.8 U	360	65 I	4,000	5.3 U	270 U	45 I
	09/13/2012		4.4 U	86 I	61 I	2,600	7.9 U	350 U	67 I

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-BW0003E	02/01/2011	51 to 54	0.3 U	23	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	03/22/2011		0.3 U	0.62 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	03/22/2011*		0.3 U	1.5 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	03/29/2011		0.43 I	1.2 I	0.3 U	0.3 U	0.3 U	6.7 U	0.74 I
	04/07/2011		0.3 U	0.56 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/19/2011		0.3 U	0.72 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	07/07/2011		980 I	1,300 I	200 U	230 U	1,500,000	520,000	560 I
	08/02/2011		580 U	1,700 I	500 U	580 U	420,000	890,000	780 U
	10/27/2011		2.9 I	20	0.41 I	110	0.4 I	70 I	4.9 I
	02/15/2012		0.48 I	40	1.7 I	61	7.4	11 U	5.4
06/27/2012	0.23 U	4.2 I	4.8 I	66	27	11 U	0.31 U		
09/13/2012	3.1 I	58	9.4 I	270	30	44 U	8.9 I		
LC34-BW0003F	02/01/2011	58 to 61	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/19/2011		0.3 U	0.94 I	0.3 U	0.39 I	0.3 U	6.7 U	0.4 U
	08/02/2011		2.7 I	13 I	0.5 U	1.3 I	93	18,000	0.78 U
	10/27/2011		0.5 I	210	1.1 I	190	0.21 U	11 U	0.92 I
	02/15/2012		0.23 U	0.81 I	4.3 I	190	0.21 U	11 U	0.31 U
	06/27/2012		26	15	0.43 I	0.91 I	0.21 U	11 U	66
09/13/2012	0.82 I	3.6 I	2.7 I	90	0.39 U	18 U	0.31 U		
LC34-IW0002I	02/03/2011	25 to 30	370 I	27,000	510	630	30 U	670 U	47,000
	03/22/2011		200 I	27,000	550 I	1,100 I	150 U	3,400 U	53,000
	03/29/2011		110 I	23,000	500	980	15 U	340 U	61,000
	04/07/2011		150 U	23,000	510 I	1,100 I	150 U	3,400 U	77,000
	04/18/2011		180 I	21,000	430 I	1,000 I	150 U	3,400 U	63,000
	08/01/2011		280 I	13,000	220 I	270 I	11,000 J	630,000	9,400 J
	08/01/2011*		310 I	14,000	260 I	370 I	33,000 J	590,000	16,000 J
	10/26/2011		57 I	15,000	320 I	930	21 U	1,100 U	34,000
	02/15/2012		46 U	3,500	140 I	300 I	42 U	2,100 U	25,000
06/26/2012	46 U	970 I	40 I	110 I	42 U	2,100 U	19,000		
09/13/2012	5.5 I	500	17 I	43	2 U	87 U	11,000		
LC34-IW0002D	02/02/2011	35 to 40	17,000	57,000	390 I	170 I	30 U	670 U	40 U
	03/22/2011		3,100	25,000	260 I	1,300 I	75 U	1,700 U	190 I
	03/28/2011		1,600	28,000	320 I	1,900	60 U	1,400 U	2,000
	04/07/2011		1,100 IJ	28,000	360 I	2,800 J	75 U	1,700 U	6,500 J
	04/18/2011		490 I	26,000	370 I	3,500	75 U	1,700 U	13,000
	08/01/2011		74 I	22,000	170 I	2,200	110 I	200,000	62 U
	10/26/2011		73 I	16,000	290 I	4,000	21 U	2,700 I	3,700
	02/16/2012		26 I	4,700	300	9,400	11 U	530 U	450
	06/26/2012		12 I	3,400	190	3,800	5.3 U	270 U	120 I
09/13/2012	5.6 I	1,300	110	2,400	7.9 U	350 U	6.2 U		

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-IW0002D1	02/02/2011	50 to 55	760	1,200	6.3 I	6.4 I	3 U	67 U	52
	03/22/2011		260	380	2.5 I	3.3 I	0.75 U	17 U	6.9 I
	03/28/2011		75	350	3 I	1.9 I	0.75 U	17 U	2 I
	04/07/2011		59	770	5.7 I	3.5 I	0.75 U	17 U	1.2 I
	04/18/2011		7.7	24	0.3 U	0.98 I	0.3 U	6.7 U	0.4 U
	08/01/2011		1,300	7,500 J	81	1,900	31	2,600	520
	10/26/2011		0.81 I	4.3 I	1.5 I	60	0.36 I	11 U	0.51 I
	02/16/2012		4.1 I	250	35	2,000	0.21 U	11 U	47
	06/26/2012		4.7 U	9.8 I	58 I	2,000	4.2 U	210 U	7.0 I
09/13/2012	4.4 U	48 I	57 I	2,000	7.9 U	350 U	55 I		
LC34-IW0067D	02/02/2011	38 to 43	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	1.1 I	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.74 I	0.2 U	7.4	0.21 U	11 U	0.31 U
	02/14/2012		0.23 U	0.68 I	0.2 U	8.4	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	1.2 I	0.2 U	18	0.21 U	11 U	0.31 U
LC34-IW0067D1	02/03/2011	63 to 73	0.3 U	0.88 I	0.3 U	0.3 U	0.3 U	6.7 U	0.46 I
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	02/14/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
LC34-IW0070D	02/02/2011	38 to 43	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	02/15/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
LC34-IW0070D1	02/02/2011	65 to 75	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	02/15/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
LC34-IW0071D	02/02/2011	38 to 43	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	02/15/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
LC34-IW0071D1	02/02/2011	65 to 75	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	10/25/2011		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	02/14/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U
	06/26/2012		0.23 U	0.2 U	0.2 U	0.23 U	0.21 U	11 U	0.31 U

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-IW0076	02/02/2011	70 to 80	0.3 U	0.40 I	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	04/18/2011		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	6.7 U	0.4 U
	08/01/2011		0.46 U	4 I	0.4 U	0.46 U	550	200 I,V	1.3 I
	10/25/2011		0.27 I	110	4 I	5	0.21 U	90 I	54
	02/15/2012		0.75 I	180	8.1	8.4	0.21 U	11 U	150
	06/26/2012		2.7 I	5,000	81	170	0.21 U	960	660
	09/13/2012		0.49 I	5 U	3.9 I	3.5 I	0.39 U	18 U	87
LC34-RW0007	02/02/2011	35 to 42	54,000	50,000	300 I	60 U	60 U	1,400 U	13,000
	03/22/2011		14,000	27,000	210 I	610 I	75 U	1,700 U	7,400
	03/28/2011		17,000	31,000	200 I	740 I	60 U	1,400 U	8,200
	03/28/2011*		16,000	32,000	200 I	810 I	60 U	1,400 U	7,100
	04/07/2011		14,000	33,000	290 I	1,000 I	75 U	1,700 U	11,000
	04/19/2011		12,000	25,000	170 I	990 I	75 U	1,700 U	8,500
	04/19/2011*		12,000	23,000	160 I	900 I	60 U	1,400 U	8,700
	07/07/2011		21,000	20,000	150 I	690 I	410,000	140,000	13,000
	08/01/2011		2,400 J	31,000	130 I	770 I	53 U	180,000	2,900 J
	08/01/2011*		3,300 J	36,000	130 I	850 I	130 I	230,000	4,100 J
	08/12/2011		3,300	26,000	50 U	58 U	33,000	230,000	16,000
	08/18/2011		7,100	23,000	50 U	1,400	53 U	130,000	11,000
	08/24/2011		10,000	21,000	130 I	1,700	42 U	26,000 I	13,000
	08/31/2011		10,000	20,000	150 I	2,000	21 U	29,000	13,000
	09/15/2011		8,400	19,000	150 I	3,100	21 U	1,100 U	14,000
	09/28/2011		5,700	15,000	140 I	3,700	21 U	2,700 I	12,000
	10/13/2011		4,300	15,000	190 I	4,300	21 U	2,900 I	11,000
	10/26/2011		3,900	16,000	170 I	4,800	21 U	1,800 I	11,000
	11/10/2011		3,500	16,000	200 I	6,400	21 U	1,100 U	12,000
	11/22/2011		3,200	14,000	160 I	4,900	21 U	1,100 U	13,000
	12/15/2011		1,500	11,000	180 I	6,000	21 U	1,100 U	7,500
	01/05/2012		160 I	4,500	200 I	6,200	11 U	530 U	2,600
	01/26/2012		1,700	15,000	250 I	10,000	0.21 U	11 U	11,000
	02/14/2012		560 J	8,900	250 I	6,400	11 U	530 U	5,600 J
	02/14/2012*		1,100 J	9,100	210 I	7,600	11 U	530 U	9,500 J
	03/15/2012		120 I	3,600	160	3,000	5.3 U	270 U	870
	04/19/2012		650	7,200	200	8,100	5.3 U	270 U	8,200
05/17/2012	520	6,000	190 I	8,700	11 U	530 U	11,000		
06/26/2012	820	5,500	250	8,100	11 U	530 U	9,500		
07/19/2012	640	4,600	260 I	7,900	21 U	1,100 U	8,900		
08/16/2012	660	4,300	190 I	7,400	20 U	870 U	8,700		
09/13/2012	210	2,300	100	2,000	7.9 U	350 U	2,900		

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
LC34-RW0008	02/02/2011	47 to 57	4,900	3,300	20 I	18 I	7.5 U	170 U	620
	03/22/2011		1,300	450	3.0 I	34 I	3 U	67 U	190
	03/28/2011		840	280	1.9 I	14 I	1.5 U	34 U	130
	04/07/2011		790	360	1.9 I	13 I	1.5 U	34 U	140
	04/19/2011		1,000	510	3.0 I	24 I	3 U	67 U	160
	04/19/2011*		1,100	500	3.3 I	23 I	3 U	67 U	180
	07/07/2011		1,100	4,000	40 U	140 I	81,000	8,700 I	62 U
	08/01/2011		3.5 I	55	19	2,600	4 I	63 I,V	3.2 I
	08/01/2011*		3.2 I	47	17	2,900	4.3 I	220 I	2.2 I
	08/12/2011		1,900	1,700	4 U	4.7 U	8,100	120,000	710
	08/18/2011		1,700	890	2 U	94	2.1 U	9,300	580
	08/24/2011		1,500	830	3.9 I	160	2.1 U	110 U	580
	08/31/2011		940	610	3.2 I	150	1.1 U	53 U	310
	09/15/2011		970	860	5.4 I	310	1.1 U	53 U	470
	09/28/2011		1,100	1,100	7.6 I	410	1.1 U	53 U	590
	10/13/2011		1,300	1,300	10 I	610	2.1 U	110 U	760
	10/26/2011		1,900 J	1,700 J	12 I	630	2.1 U	110 U	1,200 J
	11/10/2011		2,000	2,000	14 I	640	2.1 U	110 U	1,500
	11/22/2011		1,100	1,600	12 I	580	2.1 U	110 U	1,100
	12/15/2011		1,500	2,300	17 I	820	4.2 U	210 U	1,700
	1/5/2012		1,100	1,400	12 I	560	2.1 U	110 U	1,300
1/26/2012	940	1,700	22 I	1,000	2.1 U	110 U	1,600		
2/14/2012	570	1,100	14 I	670	2.1 U	110 U	850		
3/15/2012	620	1,100	17 I	900	2.1 U	110 U	1,100		
4/19/2012	290	870	17 I	1,100	2.1 U	110 U	670		
5/17/2012	300	1,300	18 I	870	2.1 U	110 U	1,100		
6/26/2012	620	970	21 I	990	1.1 U	53 U	900		
7/19/2012	450	640	23 I	870	1.1 U	53 U	840		
8/16/2012	460	700	13 I	600	2 U	87 U	1,100		
9/13/2012	56	750	14 I	710	2 U	87 U	530		
LC34-IJ0015	02/03/2011	32 to 42	3,400	70,000	320 I	3,300	150 U	3,400 U	200 U
LC34-IJ0016	02/03/2011	47 to 57	600 I	37,000	180 I	400 I	60 U	1,400 U	80 U
LC34-IJ0019	02/03/2011	32 to 42	15 U	6,400	180 I	5,500	15 U	340 U	140 I
LC34-IJ0020	02/03/2011	47 to 57	3 U	1,400	30 I	410	3 U	67 U	23 I

**Table E-1-5. Summary of Groundwater Sampling Results: Volatile Organic Compounds
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	1,1,2-Trichlorotrifluoroethane (µg/L)
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Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. * indicates duplicate sample.
4. I indicates the result is between the method detection limit (MDL) and the practical quantitation limit.
5. J indicates the result is an estimated value based on data validation.
6. Q indicates that the sample was analyzed after the accepted holding time.
7. U indicates result not detected above method detection limit (MDL).
8. V indicates analyte was detected in both the sample and the associated method blank.
9. **Bold** indicates the result was detected above method detection limit (MDL).
10. Results not displayed to a set number of significant digits.

**Table E-1-6. Summary of Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Bromide (mg/L)	Iodide (mg/L)	
LC34-BW0001A	04/18/2011	23 to 26	0.29 U	30	76	0.07 U	0.05 U	49.2	0.48 U	83.8	270	0.3 U	0.2 U	
	08/01/2011		15	27	92	0.2 U	0.3 U	53.6	0.2 U	137	293	0.6 U	0.2 U	
	10/25/2011		3.9	35	83	0.2 U	0.1 U	49.6	0.2 U	76.4	299	0.6 U	0.2 U	
	02/16/2012		3.0	26	64	0.2 U	0.004 U	56	0.2 U	65.8 J	241	0.6 U	0.2 U	
	06/26/2012		3.2	25	89	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		1.2	12	46	NA	NA	NA	NA	NA	NA	NA	NA	NA
LC34-BW0001B	04/18/2011	30 to 33	0.29 U	17	85	0.07 U	0.3 U	44.1	0.48 U	258	329	0.3 U	0.2 U	
	08/01/2011		51	30	100	0.2 U	1 U	38.1	4.5	322	350	0.6 U	0.2 U	
	10/25/2011		6.5	12	23	0.2 U	0.2 UQ	19.7	2.1	119	880	50.6	89.1	
	02/16/2012		16	30	83	0.2 U	0.004 U	31.5	3.4	95.8	328	3.2	0.2 U	
	02/16/2012*		NA	NA	NA	NA	NA	NA	3.2	NA	NA	NA	NA	NA
	06/26/2012		7.3	30	70	NA	NA	NA	NA	NA	NA	NA	NA	NA
09/13/2012	6.3	31	71	NA	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0001C	04/18/2011	37 to 40	1 U	9.5	62	0.07 U	0.5 U	26.9	0.5 U	570	341	0.3 U	0.2 U	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	14.8	22	
	08/01/2011		130 Q	16 Q	47 Q	0.2 U	2 U	2.3	6.2	500	408	23.2	17.9	
	10/25/2011		57	10	64	0.2 U	0.5 UQ	0.5 U	9	287	718	40.2	39.9	
	02/16/2012		59	53	600	0.2 U	0.004 U	0.5 U	5.8	247	760	29.3	40.7	
	02/16/2012*		NA	NA	NA	NA	NA	NA	NA	NA	NA	36.6	0.2 U	
	06/26/2012		50	660	1,600	NA	NA	NA	NA	NA	NA	NA	NA	
09/13/2012	23	200	180	NA	NA	NA	NA	NA	NA	NA	NA			
LC34-BW0001D	04/18/2011	44 to 47	0.29 U	5.3	14	0.07 U	0.5 U	76.4	0.5 U	780	251	0.3 U	0.2 U	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6	0.2 U	
	08/01/2011		140	5.4	19	0.2 U	2 U	79.2	1.2	670	250	2.9	0.2 U	
	08/01/2011*		NA	NA	NA	NA	NA	NA	NA	NA	245	NA	NA	
	10/25/2011		99	3.5	13	0.2 U	1 UQ	69 J	2.8	568	436	12.7	0.2 U	
	02/16/2012		100	4.6	27	0.2 U	0.004 U	16.3	15.5	751	465	8.9	0.2 U	
	06/26/2012		89	25	110	NA	NA	NA	NA	NA	NA	NA	NA	
09/13/2012	93	43	160	NA	NA	NA	NA	NA	NA	NA	NA			
LC34-BW0001E	04/18/2011	51 to 54	0.29 U	0.3 U	6.8	0.07 U	0.9 U	94.9	0.5 U	600	167	1.2	0.2 U	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	0.2 U	
	08/01/2011		10	2.1	9.9	0.2 U	2 U	77.3	1.5	595	183	1.4	0.2 U	
	08/01/2011*		NA	NA	NA	NA	NA	NA	1.5	NA	NA	NA	0.2 U	
	10/25/2011		6.9	110	95	0.2 U	1 UQ	16.8	9.3	625	299	4.8	0.2 U	
	02/16/2012		3.7	110	620	0.2 U	0.004 U	25.4	8.9	603	239	2.9	0.2 U	
	06/26/2012		13	610	2,200	NA	NA	NA	NA	NA	NA	NA	NA	
09/13/2012	7.3 U	390	2,700	NA	NA	NA	NA	NA	NA	NA	NA			
LC34-BW0001F	04/18/2011	58 to 61	0.29 U	0.3 U	5.8	0.07 U	0.9 U	112	0.5 U	636	166	1.1	0.2 U	
	08/01/2011		0.29 U	0.3 U	4.3	0.2 U	2 U	45.7	5.8	409	504	26.9	0.2 U	
	08/01/2011*		NA	NA	NA	0.2 U	2 U	45.4	NA	406	NA	26.3	0.2 U	
	10/25/2011		0.29 U	0.3 U	51	0.2 U	1 UQ	103	1.1	670	169	1.6	0.2 U	
	02/16/2012		1.8	58	270	0.2 U	0.004 U	37.4	6.7	619	250	3	0.2 U	
	06/26/2012		1.5 U	56	440	NA	NA	NA	NA	NA	NA	NA	NA	
09/13/2012	1.5 U	99	300	NA	NA	NA	NA	NA	NA	NA	NA			
LC34-BW0002A	04/19/2011	23 to 26	0.29 U	33	75	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U	
	04/19/2011*		0.29 U	32	80	NA	NA	NA	NA	NA	NA	NA	NA	
	08/02/2011		32 J	18	86	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U	
	10/26/2011		3	46	660	NA	NA	NA	NA	NA	NA	11.8	14	
	02/15/2012		98	140	410	NA	NA	NA	NA	NA	NA	2.7	2.6	
	02/15/2012*		96	150	410	NA	NA	NA	NA	NA	NA	NA	NA	
	06/26/2012		0.58 U	97	92	NA	NA	NA	NA	NA	NA	NA	NA	
09/11/2012	0.29 U	42	39	NA	NA	NA	NA	NA	NA	NA	NA			

**Table E-1-6. Summary of Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Bromide (mg/L)	Iodide (mg/L)
LC34-BW0002B	04/19/2011	30 to 33	0.29 U	12	93	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U
	08/02/2011		82 J	14	130	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	10/26/2011		15	27	82	NA	NA	NA	NA	NA	NA	6.8	7.4
	02/15/2012		4.5	110	150	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	06/26/2012		0.58 U	100	230	NA	NA	NA	NA	NA	NA	NA	NA
	09/11/2012		0.58 U	44	140	NA	NA	NA	NA	NA	NA	NA	NA
LC34-BW0002C	04/19/2011	37 to 40	0.29 U	8	58	0.07 U	0.9 U	47.8	0.48 U	687	247	0.3 U	0.2 U
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	24.1	14.4
	08/02/2011		69 J	21	52	0.2 U	1 U	0.5 U	10.5	539 J	480	7.6 J	12.9
	08/02/2011*		NA	NA	NA	0.2 U	0.1 U	0.5 U	NA	53.2 J	NA	8.6	NA
	10/26/2011		110	31	170	0.2 U	1 UQ	4.2	10.9	548	366	2.9	6.6
	02/14/2012		0.58 U	170	140	0.2 U	0.004 U	26.2	2.4	50.5	233	0.6 U	0.2 U
	02/14/2012*		NA	NA	NA	0.2 U	0.004 U	25.9	NA	46.8	NA	NA	NA
	06/26/2012		65	430	690	NA	NA	NA	NA	NA	NA	NA	NA
09/11/2012	52	890	1,800	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0002D	04/19/2011	44 to 47	0.29 U	2.9	9	NA	NA	NA	NA	NA	NA	1.3	0.2 U
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	0.2 U
	08/02/2011		17 J	14	290	NA	NA	NA	NA	NA	NA	1.1	0.2 U
	08/02/2011*		NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0.2 U
	10/26/2011		27	21	65	NA	NA	NA	NA	NA	NA	11.7	0.2 U
	02/14/2012		41	180	110	NA	NA	NA	NA	NA	NA	6.5	2.8
	06/26/2012		42	560	1,400	NA	NA	NA	NA	NA	NA	NA	NA
09/11/2012	36	1,000	1,600	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0002E	04/19/2011	51 to 54	0.29 U	0.3 U	6.8	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	0.2 U
	08/02/2011		0.29 U	0.3 U	8.4	NA	NA	NA	NA	NA	NA	1.4	0.2 U
	10/26/2011		0.29 U	3.3	17	NA	NA	NA	NA	NA	NA	2.2	0.2 U
	02/14/2012		1.7	90	46	NA	NA	NA	NA	NA	NA	2	0.2 U
	06/26/2012		3.3	160	78	NA	NA	NA	NA	NA	NA	NA	NA
9/11/2012	3.4	160	77	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0002F	04/19/2011	58 to 61	0.29 U	0.3 U	6.4	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U
	08/02/2011		1.3 J	1.5	14	NA	NA	NA	NA	NA	NA	2.3	0.2 U
	10/26/2011		0.29 U	7.2	8.6	NA	NA	NA	NA	NA	NA	2.3	0.2 U
	02/14/2012		0.29 U	6.9	8.2	NA	NA	NA	NA	NA	NA	2	0.2 U
	06/26/2012		1.2	65	19	NA	NA	NA	NA	NA	NA	NA	NA
	09/11/2012		1.6	110	22	NA	NA	NA	NA	NA	NA	NA	NA
LC34-BW0003A	04/19/2011	23 to 26	0.29 U	110	94	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U
	08/02/2011		12 J	240	110	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	08/02/2011*		12 J	250	110	NA	NA	NA	NA	NA	NA	NA	NA
	10/26/2011		1.9	53	94	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	02/15/2012		0.29 U	5.4	15	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	06/27/2012		1.1	24	82	NA	NA	NA	NA	NA	NA	NA	NA
09/11/2012	0.29 U	11	110	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0003B	04/19/2011	30 to 33	0.29 U	160	97	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U
	08/02/2011		24 J	410	85	NA	NA	NA	NA	NA	NA	7.7	9.6
	10/27/2011		2.3	99	95	NA	NA	NA	NA	NA	NA	1.2	0.2 U
	02/15/2012		0.29 U	11	24	NA	NA	NA	NA	NA	NA	0.6 U	0.2 U
	06/27/2012		0.29 U	20	76	NA	NA	NA	NA	NA	NA	NA	NA
	09/11/2012		0.29 U	12	99	NA	NA	NA	NA	NA	NA	NA	NA

**Table E-1-6. Summary of Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Bromide (mg/L)	Iodide (mg/L)
LC34-BW0003C	04/19/2011	37 to 40	0.29 U	260	96	0.07 U	0.9 U	34	0.48 U	490	279	0.3 U	0.2 U
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	36.1	58
	08/02/2011		15 J	150	710	0.2 U	0.8 U	3.4	14.6	329	760	52	64.1
	08/02/2011*		NA	NA	NA	NA	NA	NA	14.7	NA	746	NA	NA
	10/27/2011		12	770	300	0.2 U	0.8 UQ	13.3	4.9	360	313	1.5	0.2 U
	02/15/2012		2.9 U	640	240	0.2 U	0.004 U	35.3	4.2	237	308	0.6 U	0.2 U
	02/15/2012*		NA	NA	NA	NA	NA	NA	NA	NA	310	NA	NA
	06/27/2012		13	620	210	NA	NA	NA	NA	NA	NA	NA	NA
09/13/2012	9.6	410	180	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-BW0003D	04/19/2011	44 to 47	0.29 U	4.5	44	NA	NA	NA	NA	NA	NA	1.3	0.2 U
	04/19/2011*		1 U	4.3	43	NA	NA	NA	NA	NA	NA	NA	NA
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	23.5	0.2 U
	08/02/2011		20 J	5.5	18	NA	NA	NA	NA	NA	NA	38.4	0.2 U
	10/26/2011		11	35	1,800	NA	NA	NA	NA	NA	NA	10.8	0.2 U
	02/15/2012		7.3 U	310	1,700	NA	NA	NA	NA	NA	NA	5.7	3.3
	06/27/2012		26	910	1,400	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		26	1,200	1,400	NA	NA	NA	NA	NA	NA	NA	NA
LC34-BW0003E	04/19/2011	51 to 54	0.29 U	0.3 U	6.5	NA	NA	NA	NA	NA	NA	1.3	0.2 U
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	44.5	0.2 U
	08/02/2011		0.29 UJ	1.7	30	NA	NA	NA	NA	NA	NA	58.2	0.2 U
	10/27/2011		0.29 U	4.1	2,000	NA	NA	NA	NA	NA	NA	8.8	0.2 U
	02/15/2012		6.1	310	390	NA	NA	NA	NA	NA	NA	3.2	0.2 U
	06/27/2012		18	850	680	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		21	1,000	920	NA	NA	NA	NA	NA	NA	NA	NA
LC34-BW0003F	04/19/2011	58 to 61	0.29 U	0.3 U	7	NA	NA	NA	NA	NA	NA	1.4	0.2 U
	08/02/2011		0.29 U	0.3 U	750	NA	NA	NA	NA	NA	NA	2.5	0.2 U
	08/02/2011*		0.29 U	0.3 U	850	NA	NA	NA	NA	NA	NA	NA	NA
	10/27/2011		1.5	5.1	170	NA	NA	NA	NA	NA	NA	3.1	0.2 U
	02/15/2012		7.8	450	570	NA	NA	NA	NA	NA	NA	2.7	0.2 U
	06/27/2012		10 U	85	1,300	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		20 U	290	1,100	NA	NA	NA	NA	NA	NA	NA	NA
LC34-IW0002I	04/18/2011	25 to 30	0.29 U	19	61	0.07 U	0.05 U	51.4	0.5 U	73.1	250	0.3 U	0.2 U
	08/01/2011		23	7.1	44	0.2 U	0.3 U	0.5 U	1.3	138	632	34.8	44.5
	10/26/2011		6.2	29	69	0.2 U	0.1 U	30.9	2.7	65.4 J	285	2.7	2.5 J
	02/15/2012		3.8	9.2	51	0.2 U	0.004 U	44.3	0.2 U	52.1 J	228	0.6 U	0.2 U
	06/26/2012		1.6	5.5	35	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		1.6	3.1	24	NA	NA	NA	NA	NA	NA	NA	NA

**Table E-1-6. Summary of Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Bromide (mg/L)	Iodide (mg/L)	
LC34-IW0002D	04/18/2011	35 to 40	0.29 U	110	110	0.07 U	0.3 U	31.8	0.48 U	301	318	0.3 U	0.2 U	
	08/01/2011		48	28	43	0.2 U	1 U	0.5 U	3.4	352	1,150	9.1	41.6	
	10/26/2011		48	120	230	0.2 U	0.6 UQ	8.0	10.5	227	642	20.3	18.3	
	02/16/2012		13	44	660	0.2 U	0.004 U	0.5 U	7.6	96.6	420	10.8	10.8	
	06/26/2012		40	920	970	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		24	670	310	NA	NA	NA	NA	NA	NA	NA	NA	NA
LC34-IW0002D1	04/18/2011	50 to 55	0.29 U	0.3 U	8.6	0.07 U	0.9 U	105	0.48 U	628	167	1.6	0.2 U	
	08/01/2011		20	29	5,600	0.2 U	2 U	0.5 U	6.2	451	660	9	5.1	
	08/01/2011*		22	31	5,800	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/26/2011		2.9	140	390	0.2 UQ	1 U	43.3	9.1	650	244	3.5	0.2 U	
	02/16/2012		7.6	370	240	0.2 U	0.004 U	5.1	14.4	572	301	4.7	2.2	
	06/26/2012		32	1,400	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA
09/13/2012	30	1,600	2,700	NA	NA	NA	NA	NA	NA	NA	NA	NA		
LC34-IW0076	04/18/2011	70 to 80	0.29 U	0.3 U	5.8	NA	NA	NA	NA	NA	NA	0.3 U	0.2 U	
	08/01/2011		0.29 U	0.3 U	7.7	NA	NA	NA	NA	NA	NA	1.2	0.2 U	
	10/25/2011		0.29 U	0.3 U	790	NA	NA	NA	NA	NA	NA	2.5	0.2 U	
	02/15/2012		2.9 U	3 U	780	NA	NA	NA	NA	NA	NA	1.9	0.2 U	
	06/26/2012		2.9 U	3 U	980	NA	NA	NA	NA	NA	NA	NA	NA	NA
	09/13/2012		0.73 U	6.7	210	NA	NA	NA	NA	NA	NA	NA	NA	NA
LC34-RW0007	03/22/2011	35 to 42	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7	0.2 U	
	03/28/2011		80	8.6	40	0.07 U	0.5 U	59	1.1	664	227	0.3 U	0.2 U	
	04/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.3	0.2 U
	04/19/2011		0.29 U	11	47	0.07 U	0.9 U	61.2	1.0	642	223	1.5	0.2 U	
	04/19/2011*		0.29 U	11	47	0.07 U	0.9 U	60.5	0.48 U	645	221	NA	NA	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.4	2.1
	08/01/2011		61	9.8	35	0.2 U	1 U	0.5 U	1.7	519	510	27.7	2.3	
	08/12/2011		55	14	93	0.05 U	0.004 U	17.8	9.2	264	460	11.8	15.2	
	08/18/2011		53	14	76	0.2 U	1 U	0.5 U	14.7	421	510	25.6	16.8	
	08/18/2011*		NA	NA	NA	0.2 U	NA	0.5 U	NA	NA	NA	25.2	NA	
	08/24/2011		50	12	100	0.2 UQ	1 UQ	0.5 U	24.5	516	498	20.2	10.8	
	08/31/2011		49	15	150	0.2 U	1 U	2.3	22.6	487	472	17.5	11.2	
	09/15/2011		48	33	290	0.2 U	1 UQ	0.5 U	21.1	512	445	12.9	10.3	
	09/28/2011		46	53	380	0.2 U	1 UQ	0.5 U	19.9	509	440	16	11.5	
	10/13/2011		48 J	86	420	0.2 U	1 U	0.5 U	16.9	433	468	17.8	14.5	
	10/26/2011		39	110	330	0.2 U	1 UQ	2.1	17.1	437	468	13.6	14	
	11/10/2011		44	150	520	0.2 U	0.004 U	0.5 U	16.1	472	470	21.4	12.9	
	11/22/2011		41	190	510	0.2 U	0.004 U	2.1	17.7	469	430	13.8	10.6	
	12/15/2011		46	300	1,100	0.2 U	0.004 U	4.3	13.6	384	455	13.1	10.9	
	01/05/2012		30	740	3,200	0.2 U	0.004 U	3.7	13.5	199	460	7.3	12.4	
01/26/2012	45	480	1,300	0.2 U	0.004 U	2.2	15	431	368	7.8	7.9			
02/14/2012	37	500	1,100	0.2 U	0.004 U	4.2	15.1	409	390	8.0	7.2			
06/26/2012	41	1,200	1,700	NA	NA	NA	NA	NA	NA	NA	NA	NA		
09/13/2012	11	370	360	NA	NA	NA	NA	NA	NA	NA	NA	NA		

**Table E-1-6. Summary of Groundwater Sampling Results: Dissolved Hydrocarbon Gases, Anions & Tracers
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)	Bromide (mg/L)	Iodide (mg/L)	
LC34-RW0008	03/22/2011	47 to 57	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	0.2 U	
	03/28/2011		3.1	0.3 U	7.7	0.07 U	0.5 U	91.3	0.5 U	665	168	1.8	0.2 U	
	04/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	0.2 U
	04/19/2011		0.29 U	0.3 U	8.8	0.07 U	0.9 U	92.4	0.5 U	675	173	1.7	0.2 U	
	04/19/2011*		0.29 U	11	47	0.07 U	0.9 U	60.5	0.48 U	645	221	NA	NA	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8	0.2 U
	08/01/2011		16	310	30	0.2 U	2 U	0.5 U	2.9	602	279	4.8	0.2 U	
	08/01/2011*		NA	NA	NA	0.2 U	1 U	0.5 U	NA	629	NA	NA	NA	
	08/12/2011		7.8	2.0	120	0.05 U	0.004 U	23.1	10.4	594	378	17.3	0.2 U	
	08/18/2011		5.2	7.8	300	0.2 U	1 U	3.2	16.2	641	369	8.4	0.2 U	
	08/24/2011		4.3	9.3	370	0.2 UQ	1 UQ	0.5 U	19.7	604	368	8.2	0.2 U	
	08/31/2011		3.8	23	520	0.2 U	1 U	3.7	18.6	590	329	5.6	0.2 U	
	09/15/2011		4.4	26	430	0.2 U	1 UQ	17.4	15.4	609	299	4.8	0.2 U	
	09/28/2011		5.6	28	410	0.2 U	1 UQ	13.4	14	633	271	2.8	0.2 U	
	10/13/2011		7.4 J	71	460	0.2 U	1 U	15.9	14.5	624	287	4.2	0.2 U	
	10/26/2011		8.8	95	400	0.2 U	1 UQ	14.2	14.7	632	288	4.5	0.2 U	
	11/10/2011		10	140	450	0.2 U	0.004 U	7.3	14.4	652	300	4.5	0.2 U	
	11/22/2011		10	190	450	0.2 U	0.004 U	7.3	15	620	294	4.0	0.2 U	
	12/15/2011		13	270	600	0.2 U	0.004 U	7.0	13.9	605	321	5.3	0.2 U	
	01/05/2012		13	320	670	0.2 U	0.004 U	3.9	13.5	679	314	4.5	0.2 U	
01/26/2012	13	370	490	0.2 U	0.004 U	3.5	13.3	622	288	4.8	0.2 U			
02/14/2012	13	450	510	0.2 U	0.004 U	2.9	13.3	621	300	4.3	0.2 U			
06/26/2012	23	910	620	NA	NA	NA	NA	NA	NA	NA	NA			
09/13/2012	30	940	760	NA	NA	NA	NA	NA	NA	NA	NA			

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. mg/L indicates milligrams per liter.
4. Alkalinity is reported as mg/L as CaCO₃.
5. J indicates the result is an estimated value based on data validation.
6. Q indicates that the sample was analyzed after the accepted holding time.
7. U indicates result not detected above method detection limit (MDL).
8. NA indicates not analyzed.
9. **Bold** indicates the result was detected above method detection limit (MDL).
10. * indicates duplicate sample.
11. Results not displayed to a set number of significant digits.

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-BW0001A	02/01/2011	23 to 26	NA	NA	NA	NA	NA	NA	30 U	670 U
	04/18/2011		3.2	1.7	0.56 U	0.072 U	0.13 U	0.018 U	150 U	3,400 U
	08/01/2011		4.2	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	340 I	5,300 U
	08/01/2011*		304	NA	NA	NA	NA	NA	670 I	49,000 I
	10/25/2011		7.2	11	0.56 U	0.072 U	0.13 U	0.018 U	53 U	2,700 U
	02/16/2012		2.8	1.6	0.56 U	0.072 U	0.13 U	0.018 U	110 U	5,300 U
	02/16/2012*		3.0	NA	NA	NA	NA	NA	NA	NA
	06/26/2012		2.6	NA	NA	NA	NA	NA	110 U	5,300 U
09/13/2012	2.3	NA	NA	NA	NA	NA	39 U	1,800 U		
LC34-BW0001B	02/01/2011	30 to 33	NA	NA	NA	NA	NA	NA	60 U	1,400 U
	04/18/2011		5.7	27	0.56 U	2.3	0.13 U	0.018 U	300 U	6,700 U
	08/01/2011		8.0	0.073 U	0.56 U	1.7	0.13 U	0.018 U	1,000 I	11,000 U
	10/25/2011		760	970	180	0.72 U	1.3 U	0.18 U	56,000	1,400,000
	02/16/2012		32	47	17	0.072 U	0.13 U	0.018 U	210 U	11,000 U
	06/26/2012		4.9	NA	NA	NA	NA	NA	210 U	11,000 U
	09/13/2012		3.4	NA	NA	NA	NA	NA	98 U	4,400 U
LC34-BW0001C	02/01/2011	37 to 40	NA	NA	NA	NA	NA	NA	150 U	3,400 U
	03/22/2011		NA	NA	NA	NA	NA	NA	75 U	1,700 U
	03/29/2011		NA	NA	NA	NA	NA	NA	60 U	1,400 U
	04/07/2011		NA	NA	NA	NA	NA	NA	75 U	1,700 U
	04/18/2011		7.3	65	0.56 U	1.2	0.13 U	0.018 U	150 U	3,400 U
	07/07/2011		NA	NA	NA	NA	NA	NA	420,000	320,000
	08/01/2011		301	370	120	0.15 U	0.26 U	0.036 U	95,000	280,000
	08/01/2011*		304	NA	NA	NA	NA	NA	NA	NA
	10/25/2011		511	480	530	0.36 U	12	0.09 U	110 U	200,000
	02/16/2012		504	390	440	0.36 U	13	0.09 U	53 U	2,700 U
	06/26/2012		120	NA	NA	NA	NA	NA	53 U	2,700 U
09/13/2012	10.4	NA	NA	NA	NA	NA	98 U	4,400 U		
LC34-BW0001D	02/01/2011	44 to 47	NA	NA	NA	NA	NA	NA	150 U	3,400 U
	04/18/2011		7.5	50	0.56 U	1.1	0.13 U	0.018 U	300 U	6,700 U
	07/07/2011		NA	NA	NA	NA	NA	NA	60,000	23,000 I
	08/01/2011		37.2	21	4	1.2	0.13 U	0.018 U	71,000	15,000 I
	08/01/2011*		NA	NA	NA	NA	NA	NA	84,000	22,000 I
	10/25/2011		241	340	29	0.15 U	0.26 U	0.036 U	270,000	310,000
	02/16/2012		176	200	140	0.15 U	0.26 U	0.036 U	210 U	36,000 I
	06/26/2012		99	NA	NA	NA	NA	NA	210 U	11,000 U
09/13/2012	92	NA	NA	NA	NA	NA	200 U	8,700 U		

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-BW0001E	02/01/2011	51 to 54	NA	NA	NA	NA	NA	NA	3 U	67 U
	03/22/2011		NA	NA	NA	NA	NA	NA	1.5 U	34 U
	03/29/2011		NA	NA	NA	NA	NA	NA	0.75 U	17 U
	04/07/2011		NA	NA	NA	NA	NA	NA	0.75 U	17 U
	04/18/2011		3.3	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.6 U	14 U
	07/07/2011		NA	NA	NA	NA	NA	NA	3,500	1,500 I
	08/01/2011		8.3	10	0.56 U	0.072 U	0.13 U	0.018 U	4.6 I	730 I,V
	10/25/2011		79	140	34	0.072 U	3.5	0.018 U	1.1 U	53 U
	02/16/2012		10.7	17	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/26/2012		21.1	NA	NA	NA	NA	NA	0.21 U	11 U
09/13/2012	9	NA	NA	NA	NA	NA	0.98 U	44 U		
LC34-BW0001F	02/01/2011	58 to 61	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.3	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	08/01/2011		606	590	30	0.36 U	0.64 U	0.09 U	900,000	620,000 I,V
	10/25/2011		4.4	1.7	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	150 I
	02/16/2012		16.8	32	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/26/2012		3.9	NA	NA	NA	NA	NA	0.21 U	11 U
09/13/2012	3.5	NA	NA	NA	NA	NA	0.4 I	18 U		
LC34-BW0002A	02/01/2011	23 to 26	NA	NA	NA	NA	NA	NA	60 U	1,400 U
	04/19/2011		3	2.4	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U
	04/19/2011*		NA	2.4	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U
	08/02/2011		3.7	13	0.56 U	0.072 U	0.13 U	0.018 U	150 I	11,000 I
	10/26/2011		178	370	57	0.15 U	0.26 U	0.036 U	21 U	1,100 U
	02/15/2012		41	100	0.56 U	0.072 U	0.13 U	0.018 U	21 U	1,100 U
	06/26/2012		2.7	NA	NA	NA	NA	NA	0.53 U	27 U
	09/11/2012		2.5	NA	NA	NA	NA	NA	0.39 U	18 U
LC34-BW0002B	02/01/2011	30 to 33	NA	NA	NA	NA	NA	NA	75 U	1,700 U
	04/19/2011		4.1	18	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U
	08/02/2011		12.9	48	3.7	1.1	0.13 U	0.018 U	130 I	2,700 U
	08/02/2011*		13.8	NA	NA	NA	NA	NA	NA	NA
	10/26/2011		107	230	30	0.15 U	2.4	0.036 U	53 U	2,700 U
	02/15/2012		11.4	19	0.56 U	0.072 U	0.13 U	0.018 U	5.3 U	270 U
	06/26/2012		3.0	NA	NA	NA	NA	NA	2.1 U	110 U
	09/11/2012		2.7	NA	NA	NA	NA	NA	0.98 U	44 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-BW0002C	02/01/2011	37 to 40	NA	NA	NA	NA	NA	NA	75 U	1,700 U
	03/22/2011		NA	NA	NA	NA	NA	NA	75 U	1,700 U
	03/29/2011		NA	NA	NA	NA	NA	NA	150 U	3,400 U
	04/07/2011		NA	NA	NA	NA	NA	NA	150 U	3,400 U
	04/19/2011		4.3	36	0.56 U	0.072 U	0.13 U	0.018 U	150 U	3,400 U
	07/07/2011		NA	NA	NA	NA	NA	NA	490,000	120,000 I
	08/02/2011		354	350	290	0.36 U	0.64 U	0.09 U	42,000	210,000
	10/26/2011		78	160	43	1.1	2	0.018 U	53 U	2,700 U
	02/14/2012		2.5	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	1.1 U	53 U
	06/26/2012		49.1	NA	NA	NA	NA	NA	1.1 U	53 U
09/11/2012	77.9	NA	NA	NA	NA	NA	39 U	1,800 U		
LC34-BW0002D	02/01/2011	44 to 47	NA	NA	NA	NA	NA	NA	7.5 U	170 U
	04/19/2011		4	3.3	0.56 U	0.072 U	0.13 U	0.018 U	7.5 U	170 U
	04/19/2011*		4	3.3	0.56 U	0.072 U	0.13 U	0.018 U	7.5 U	170 U
	07/07/2011		NA	NA	NA	NA	NA	NA	49 I	530 U
	08/02/2011		4.1	3.3	0.56 U	0.072 U	0.13 U	0.018 U	86 I	530 U
	08/02/2011*		NA	NA	NA	NA	NA	NA	81 I	4,300 I
	10/26/2011		102	130	61	0.072 U	13	0.018 U	11 U	530 U
	02/14/2012		88	190	20	0.072 U	2.1	0.018 U	21 U	1,100 U
	06/26/2012		104	NA	NA	NA	NA	NA	21 U	1,100 U
09/11/2012	87	NA	NA	NA	NA	NA	20 U	870 U		
LC34-BW0002E	02/01/2011	51 to 54	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/19/2011		3.2	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	07/07/2011		NA	NA	NA	NA	NA	NA	3,300	2,000 I
	08/02/2011		4.4	2.8	0.56 U	0.072 U	0.13 U	0.018 U	43	150 I
	10/26/2011		4	1.8	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	02/14/2012		4.6	4.3	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/26/2012		5.3	NA	NA	NA	NA	NA	0.21 U	11 U
	09/11/2012		4.9	NA	NA	NA	NA	NA	0.39 U	18 U
LC34-BW0002F	02/01/2011	58 to 61	NA	NA	NA	NA	NA	NA	1.5 U	34 U
	04/19/2011		3.1	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	04/19/2011*		NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	08/02/2011		7.1	11	0.56 U	0.072 U	0.13 U	0.018 U	0.41 I	11 U
	08/02/2011*		NA	NA	NA	NA	NA	NA	0.53 U	27 U
	10/26/2011		3.5	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	02/14/2012		3.1	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/26/2012		3.4	NA	NA	NA	NA	NA	0.21 U	11 U
	09/11/2012		3.3	NA	NA	NA	NA	NA	0.39 U	18 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-BW0003A	02/01/2011	23 to 26	NA	NA	NA	NA	NA	NA	60 U	1,400 U
	04/19/2011		2.9	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	60 U	1,400 U
	08/02/2011		7.2	12	0.56 U	0.072 U	0.13 U	0.018 U	53 U	2,700 U
	10/26/2011		5.7	9	0.56 U	0.072 U	0.13 U	0.018 U	53 U	2,700 U
	02/15/2012		2.6	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	11 U	530 U
	06/27/2012		2.4	NA	NA	NA	NA	NA	11 U	530 U
	09/11/2012		2.3	NA	NA	NA	NA	NA	4 U	180 U
LC34-BW0003B	02/01/2011	30 to 33	NA	NA	NA	NA	NA	NA	30 U	670 U
	04/19/2011		3.3	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	30 U	670 U
	04/19/2011*		3.2	NA	NA	NA	NA	NA	30 U	670 U
	08/02/2011		89	120	95	0.072 U	2.1	0.018 U	88 I	1,100 U
	08/02/2011*		99	NA	NA	NA	NA	NA	NA	NA
	10/27/2011		10.6	16	2.7	0.072 U	0.13 U	0.018 U	110 U	5,300 U
	02/15/2012		2.7	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	11 U	530 U
	06/27/2012		2.6	NA	NA	NA	NA	NA	11 U	530 U
09/11/2012	2.3	NA	NA	NA	NA	NA	7.9 U	350 U		
LC34-BW0003C	02/02/2011	37 to 40	NA	NA	NA	NA	NA	NA	30 U	670 U
	03/22/2011		NA	NA	NA	NA	NA	NA	30 U	670 U
	03/29/2011		NA	NA	NA	NA	NA	NA	30 U	670 U
	04/07/2011		NA	NA	NA	NA	NA	NA	15 U	340 U
	04/19/2011		3.8	8.1	0.56 U	0.072 U	0.13 U	0.018 U	15 U	340 U
	07/07/2011		NA	NA	NA	NA	NA	NA	640,000	360,000
	08/02/2011		671	680	630	0.36 U	15	0.09 U	290	190,000
	10/27/2011		14.5	25	0.56 U	0.072 U	0.13 U	0.018 U	11 U	530 U
	02/15/2012		6.2	6.8	0.56 U	0.072 U	0.13 U	0.018 U	11 U	530 U
	06/27/2012		4.2	NA	NA	NA	NA	NA	21 U	1,100 U
09/13/2012	3.2	NA	NA	NA	NA	NA	39 U	1,800 U		
LC34-BW0003D	02/02/2011	44 to 47	NA	NA	NA	NA	NA	NA	30 U	670 U
	04/19/2011		4.1	4.8	0.56 U	0.072 U	0.13 U	0.018 U	15 U	340 U
	04/19/2011*		NA	NA	NA	NA	NA	NA	15 U	340 U
	07/07/2011		NA	NA	NA	NA	NA	NA	830,000	350,000
	08/02/2011		603	640	320	0.36 U	0.64 U	0.09 U	170,000	510,000
	08/02/2011*		NA	620	310	0.36 U	0.64 U	0.09 U	NA	NA
	10/26/2011		169	250	99	0.36 U	24	0.09 U	6.5 I	270 U
	02/15/2012		98	190	17	0.072 U	5	0.018 U	5.3 U	270 U
	06/27/2012		59	NA	NA	NA	NA	NA	5.3 U	270 U
	09/13/2012		50.1	NA	NA	NA	NA	NA	7.9 U	350 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-BW0003E	02/01/2011	51 to 54	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	03/22/2011		NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	03/22/2011*		NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	03/29/2011		NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/07/2011		NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/19/2011		3.4	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	07/07/2011		NA	NA	NA	NA	NA	NA	1,500,000	520,000
	08/02/2011		905	870	360	0.36 U	0.64 U	0.09 U	420,000	890,000
	10/27/2011		56.3	57	29	0.072 U	2.7	0.018 U	0.4 I	70 I
	02/15/2012		34.1	73	2.9	0.072 U	0.13 U	0.018 U	7.4	11 U
	06/27/2012		42.1	NA	NA	NA	NA	NA	27	11 U
09/13/2012	37.5	NA	NA	NA	NA	NA	30	44 U		
LC34-BW0003F	02/01/2011	58 to 61	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/19/2011		3.2	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	08/02/2011		107	140	58	0.072 U	13	0.018 U	93	18,000
	10/27/2011		30.1	65	4.6	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	02/15/2012		20	39	0.56 U	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/27/2012		4.5	NA	NA	NA	NA	NA	0.21 U	11 U
	09/13/2012		4.9	NA	NA	NA	NA	NA	0.39 U	18 U
LC34-IW0002I	02/03/2011	25 to 30	NA	NA	NA	NA	NA	NA	30 U	670 U
	03/22/2011		NA	NA	NA	NA	NA	NA	150 U	3,400 U
	03/29/2011		NA	NA	NA	NA	NA	NA	15 U	340 U
	04/07/2011		NA	NA	NA	NA	NA	NA	150 U	3,400 U
	04/18/2011		3.3	2.3	0.56 U	0.072 U	0.13 U	0.018 U	150 U	3,400 U
	08/01/2011		487	610	210	0.36 U	0.64 U	0.09 U	11,000	630,000
	08/01/2011*		NA	620	200	0.36 U	0.64 U	0.09 U	33,000	590,000
	10/26/2011		31.1	55	13	0.072 U	2.7	0.018 U	21 U	1,100 U
	02/15/2012		4.0	3.6	0.56 U	0.072 U	0.13 U	0.018 U	42 U	2,100 U
	02/15/2012*		NA	3.7	2 U	0.072 U	0.13 U	0.018 U	NA	NA
	06/26/2012		3.0	NA	NA	NA	NA	NA	42 U	2,100 U
	09/13/2012		2.3	NA	NA	NA	NA	NA	2 U	87 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-IW0002D	02/02/2011	35 to 40	NA	NA	NA	NA	NA	NA	30 U	670 U
	03/22/2011		NA	NA	NA	NA	NA	NA	75 U	1,700 U
	03/28/2011		NA	NA	NA	NA	NA	NA	60 U	1,400 U
	04/07/2011		NA	NA	NA	NA	NA	NA	75 U	1,700 U
	04/18/2011		5.1	24	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U
	08/01/2011		1,130	1,100	1,200	0.72 U	11	0.18 U	110 I	200,000
	08/01/2011*		NA	1,100	1,200	0.72 U	1.3 U	0.18 U	NA	NA
	10/26/2011		590	390	810	0.36 U	49	0.09 U	21 U	2,700 I
	02/16/2012		124	230	38	0.15 U	7.7	0.036 U	11 U	530 U
	06/26/2012		22.9	NA	NA	NA	NA	NA	5.3 U	270 U
09/13/2012	8.7	NA	NA	NA	NA	NA	7.9 U	350 U		
LC34-IW0002D1	02/02/2011	50 to 55	NA	NA	NA	NA	NA	NA	3 U	67 U
	03/22/2011		NA	NA	NA	NA	NA	NA	0.75 U	17 U
	03/28/2011		NA	NA	NA	NA	NA	NA	0.75 U	17 U
	04/07/2011		NA	NA	NA	NA	NA	NA	0.75 U	17 U
	04/18/2011		3.1	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	08/01/2011		587	450	2.8 U	0.36 U	21	0.09 U	31	2,600
	10/26/2011		42.7	93	5	0.072 U	0.13 U	0.018 U	0.36 I	11 U
	02/16/2012		57.6	110	9.9	0.072 U	1.5	0.018 U	0.21 U	11 U
	06/26/2012		48.9	NA	NA	NA	NA	NA	4.2 U	210 U
	09/13/2012		37.4	NA	NA	NA	NA	NA	7.9 U	350 U
LC34-IW0067D	02/02/2011	38 to 43	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.6	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/14/2012		3.6	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U
LC34-IW0067D1	02/03/2011	63 to 73	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.3	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/14/2012		3	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U
LC34-IW0070D	02/02/2011	38 to 43	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		4.1	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/15/2012		4.1	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-IW0070D1	02/02/2011	65 to 75	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.2	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/15/2012		3.1	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U
LC34-IW0071D	02/02/2011	38 to 43	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.6	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/15/2012		3.4	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U
LC34-IW0071D1	02/02/2011	65 to 75	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.3	NA	NA	NA	NA	NA	0.3 U	6.7 U
	10/25/2011		NA	NA	NA	NA	NA	NA	0.21 U	11 U
	02/14/2012		3.1	NA	NA	NA	NA	NA	0.21 U	11 U
	06/26/2012		NA	NA	NA	NA	NA	NA	0.21 U	11 U
LC34-IW0076	02/02/2011	70 to 80	NA	NA	NA	NA	NA	NA	0.3 U	6.7 U
	04/18/2011		3.3	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	0.3 U	6.7 U
	08/01/2011		3.7	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	550	200 I,V
	10/25/2011		4.7	12	13	0.072 U	0.13 U	0.018 U	0.21 U	90 I
	02/15/2012		7.3	2.8	3.3	0.072 U	0.13 U	0.018 U	0.21 U	11 U
	06/26/2012		3.3	NA	NA	NA	NA	NA	0.21 U	960
	09/13/2012		3.1	NA	NA	NA	NA	NA	0.39 U	18 U

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)	
LC34-RW0007	02/02/2011	35 to 42	NA	NA	NA	NA	NA	NA	60 U	1,400 U	
	03/22/2011		5.3	33	0.56 U	1.2	0.13 U	0.018 U	75 U	1,700 U	
	03/28/2011		4.9	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	60 U	1,400 U	
	03/28/2011*		NA	NA	NA	NA	NA	NA	60 U	1,400 U	
	04/07/2011		5.3	24	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U	
	04/19/2011		4.4	22	0.56 U	0.072 U	0.13 U	0.018 U	75 U	1,700 U	
	04/19/2011*		4.5	22	0.56 U	0.072 U	0.13 U	0.018 U	60 U	1,400 U	
	07/07/2011		NA	NA	NA	NA	NA	NA	NA	410,000	140,000
	08/01/2011		327	350	230	0.15 U	5.2	0.036 U	53 U	180,000	
	08/01/2011*		NA	NA	NA	NA	NA	NA	NA	130 I	230,000
	08/12/2011		191	260	68	0.36 U	0.64 U	0.09 U	33,000	230,000	
	08/18/2011		363	380	320	0.36 U	11	0.09 U	53 U	130,000	
	08/18/2011*		358	NA	NA	NA	NA	NA	NA	NA	NA
	08/24/2011		322	320	350	0.36 U	18	0.09 U	42 U	26,000 I	
	08/31/2011		280	290	310	0.36 U	17	0.09 U	21 U	29,000	
	09/15/2011		219	250	250	0.36 U	16	0.09 U	21 U	1,100 U	
	09/28/2011		242	260	250	0.36 U	18	0.09 U	21 U	2,700 I	
	10/13/2011		262	280	300	0.36 U	22	0.09 U	21 U	2,900 I	
	10/26/2011		246	270	270	0.36 U	17	0.09 U	21 U	1,800 I	
	11/10/2011		222	270	240	0.36 U	16	0.09 U	21 U	1,100 U	
	11/22/2011		174	240	170	0.15 U	12	0.036 U	21 U	1,100 U	
	12/15/2011		172	230	130	0.15 U	9.7	0.036 U	21 U	1,100 U	
	01/05/2012		153	220	54	0.36 U	8.9	0.09 U	11 U	530 U	
	01/26/2012		113	170	50	0.36 U	5.3	0.09 U	0.21 U	11 U	
	02/14/2012		108	170	49	0.072 U	4.9	0.018 U	11 U	530 U	
	02/14/2012*		NA	NA	NA	NA	NA	NA	11 U	530 U	
	03/15/2012		NA	NA	NA	NA	NA	NA	5.3 U	270 U	
	04/19/2012		NA	NA	NA	NA	NA	NA	5.3 U	270 U	
05/17/2012	NA	NA	NA	NA	NA	NA	11 U	530 U			
06/26/2012	63	NA	NA	NA	NA	NA	11 U	530 U			
07/19/2012	NA	NA	NA	NA	NA	NA	21 U	1,100 U			
08/16/2012	NA	NA	NA	NA	NA	NA	20 U	870 U			
09/13/2012	9.6	NA	NA	NA	NA	NA	7.9 U	350 U			

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
LC34-RW0008	02/02/2011	47 to 57	NA	NA	NA	NA	NA	NA	7.5 U	170 U
	03/22/2011		3.6	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	3 U	67 U
	03/28/2011		3.5	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	1.5 U	34 U
	04/07/2011		3.5	0.073 U	0.56 U	0.072 U	0.13 U	0.018 U	1.5 U	34 U
	04/19/2011		3.4	1	0.56 U	0.072 U	0.13 U	0.018 U	3 U	67 U
	04/19/2011*		NA	NA	NA	NA	NA	NA	3 U	67 U
	07/07/2011		NA	NA	NA	NA	NA	NA	81,000	8,700 I
	08/01/2011		73.1	130	28	0.072 U	1.1	0.018 U	4 I	63 I,V
	08/01/2011*		73.4	NA	NA	NA	NA	NA	4.3 I	220 I
	08/12/2011		203	220	150	0.15 U	5.5	0.036 U	8,100	120,000
	08/18/2011		177	230	150	0.36 U	12	0.09 U	2.1 U	9,300
	08/24/2011		147	220	100	0.36 U	15	0.09 U	2.1 U	110 U
	08/31/2011		122	210	72	0.36 U	15	0.09 U	1.1 U	53 U
	09/15/2011		80	140	34	0.072 U	5.1	0.018 U	1.1 U	53 U
	09/28/2011		64	140	12	0.072 U	2.2	0.018 U	1.1 U	53 U
	10/13/2011		61	130	16	0.072 U	1.8	0.018 U	2.1 U	110 U
	10/26/2011		65	130	19	0.072 U	1.4	0.018 U	2.1 U	110 U
	11/10/2011		59.2	120	22	0.072 U	1.4	0.018 U	2.1 U	110 U
	11/22/2011		56	120	18	0.072 U	1.6	0.018 U	2.1 U	110 U
	12/15/2011		56.3	120	13	0.072 U	1.6	0.018 U	4.2 U	210 U
	01/05/2012		50.9	96	8.5	0.072 U	1.4	0.018 U	2.1 U	110 U
	01/26/2012		48.3	100	7.1	0.072 U	1.2	0.018 U	2.1 U	110 U
	02/14/2012		43.5	91	4.8	0.072 U	1.2	0.018 U	2.1 U	110 U
	03/15/2012		NA	NA	NA	NA	NA	NA	2.1 U	110 U
	04/19/2012		NA	NA	NA	NA	NA	NA	2.1 U	110 U
	05/17/2012		NA	NA	NA	NA	NA	NA	2.1 U	110 U
	06/26/2012		37.1	NA	NA	NA	NA	NA	1.1 U	53 U
07/19/2012	NA	NA	NA	NA	NA	NA	1.1 U	53 U		
08/16/2012	NA	NA	NA	NA	NA	NA	2 U	87 U		
09/13/2012	27	NA	NA	NA	NA	NA	2 U	87 U		

**Table E-1-7. Summary of Groundwater Sampling Results: TOC, VFAs and nBA
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Acetic Acid (mg/L)	Butanoic Acid (mg/L)	Lactic Acid (mg/L)	Propionic Acid (mg/L)	Pyruvic Acid (mg/L)	n-Butyl Acetate (µg/L)	n-Butanol (µg/L)
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Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. mg/L indicates milligrams per liter.
4. I indicates the result is between the MDL and the practical quantitation limit (PQL).
5. U indicates result not detected above method detection limit (MDL).
6. V indicates analyte was detected in both the sample and the associated method blank.
7. TOC indicates total organic carbon.
9. VFA indicates volatile fatty acid.
10. NA indicates not analyzed.
11. **Bold** indicates the result was detected above method detection limit (MDL).
12. * indicates duplicate sample.
13. Results not displayed to a set number of significant digits.

**Table E-1-8. Summary of Groundwater Sampling Results: Dissolved Metals
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Arsenic (µg/L)	Iron (µg/L)	Manganese (µg/L)
LC34-BW0001A	04/18/2011	23 to 26	4 U	230	31
	08/01/2011		2 U	20 U	29
	10/25/2011		2 U	130	24
	02/16/2012		2 U	30 U	18
LC34-BW0001B	04/18/2011	30 to 33	4 U	110	25
	08/01/2011		2 U	20 U	28
	10/25/2011		2 U	380	43
	02/16/2012		2 U	30 U	17
LC34-BW0001C	04/18/2011	37 to 40	4 U	110	17
	08/01/2011		2 U	120	30
	10/25/2011		2 U	120	39
	02/16/2012		2 U	140	57
LC34-BW0001D	04/18/2011	44 to 47	4 U	110	34
	08/01/2011		2 U	20 U	29
	10/25/2011		2 U	230	41
	02/16/2012		2 U	30 U	47
LC34-BW0001E	04/18/2011	51 to 54	4 U	60 U	16
	08/01/2011		2 U	20 U	17
	10/25/2011		2 U	30 U	18
	02/16/2012		2 U	30 U	13
LC34-BW0001F	04/18/2011	58 to 61	4 U	110	13
	08/01/2011		2 U	350	36
	10/25/2011		2 U	130	13
	02/16/2012		2 U	30 U	12
LC34-IW0002I	04/18/2011	25 to 30	4 U	60 U	31
	08/01/2011		2 U	3,500	126
	10/26/2011		2 U	550	100
	02/15/2012		2 U	30 U	69
LC34-IW0002D	04/18/2011	35 to 40	4 U	110	11
	08/01/2011		2 U	1,590	198
	10/26/2011		2 U	30 U	98
	02/16/2012		2 U	30 U	57
LC34-IW0002D1	04/18/2011	50 to 55	4 U	110	13
	08/01/2011		2 U	20 U	60
	08/01/2011*		2 U	20 U	59
	10/26/2011		2 U	30 U	13
	02/16/2012		2 U	30 U	14
LC34-IW0076	04/18/2011	70 to 80	4 U	60 U	11
	08/01/2011		2 U	20 U	2 U
	08/01/2011*		2 U	20 U	10
	10/25/2011		2 U	30 U	13
	02/15/2012		2 U	30 U	14

**Table E-1-8. Summary of Groundwater Sampling Results: Dissolved Metals
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Arsenic (µg/L)	Iron (µg/L)	Manganese (µg/L)
LC34-RW0007	04/19/2011	35 to 42	4 U	120	10
	04/19/2011*		4 U	60 U	2 U
	08/01/2011		2 U	880	91
	08/12/2011		2 U	20 U	12 V
	08/18/2011		2 U	20 U	19
	08/24/2011		2 U	20 U	25
	08/31/2011		2 U	200	23
	09/15/2011		2 U	20 U	23
	09/28/2011		2 U	140	21
	10/13/2011		2 U	20 U	23
	10/26/2011		2 U	30 U	20
	11/10/2011		2 U	30 U	22
	11/22/2011		2 U	30 U	22
	12/15/2011		2 U	30 U	15
	01/05/2012		2 U	30 U	19
	01/26/2012		2 U	30 U	25
02/14/2012	10 U	100 U	15		
LC34-RW0008	04/19/2011	47 to 57	4 U	120 J	15
	04/19/2011*		4 U	60 UJ	14
	08/01/2011		2 U	690	86
	08/12/2011		2 U	180 VJ	23 V
	08/18/2011		2 U	120	20
	08/24/2011		2 U	20 U	22
	08/31/2011		2 U	190	21
	09/15/2011		2 U	20 U	16
	09/28/2011		2 U	140	16
	10/13/2011		2 U	20 U	15
	10/26/2011		2 U	30 U	15
	11/10/2011		2 U	30 U	16
	11/22/2011		2 U	30 U	16
	12/15/2011		2 U	30 U	12
	01/05/2012		2 U	30 U	15
	01/26/2012		2 U	30 U	15
02/14/2012	10 U	100 U	12		
02/14/2012*	10 U	100 U	12		

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. J indicates the result is an estimated value based on data validation.
4. U indicates result not detected above method detection limit (MDL).
5. V indicates analyte was detected in both the sample and the associated method blank.
6. * indicates duplicate sample.
7. **Bold** indicates the result was detected above method detection limit (MDL).
8. Results not displayed to a set number of significant digits.

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-BW0001A	02/01/2011	23 to 26	23.8	7.45	1.20	5.7	-154	0.40	0.80	Clear
	04/18/2011		24.2	7.43	0.78	1.9	-156	0.38	0.51	Clear
	08/01/2011		26.9	7.67	1.16	2.0	-31	0.41	0.75	Clear
	10/25/2011		25.5	7.26	0.86	1.7	-146	0.46	0.56	Clear
	02/16/2012		24.2	7.75	0.77	2.8	-111	0.45	0.50	Clear
	06/26/2012		24.0	6.91	0.70	1.1	-116	0.60	0.45	Clear
	09/13/2012		26.2	7.41	0.89	0.5	-141	1.36	0.58	Clear
LC34-BW0001B	02/01/2011	30 to 33	24.0	7.49	2.31	9.9	-146	0.33	1.53	Clear
	04/18/2011		24.8	7.55	1.39	2.3	-159	0.24	0.91	Clear
	08/01/2011		26.4	7.62	1.81	6.5	-48	0.28	1.17	Clear
	10/25/2011		25.8	7.03	2.37	0.7	-175	0.39	1.54	Clear
	02/16/2012		24.8	7.60	0.99	2.5	-254	0.23	0.64	Clear
	06/26/2012		24.2	7.06	0.82	0.7	-119	0.24	0.53	Clear
	09/13/2012		26.3	7.59	1.06	0.6	-164	1.21	0.69	Clear
LC34-BW0001C	02/01/2011	37 to 40	24.4	7.52	2.88	8.2	-150	0.28	1.90	Clear
	03/22/2011		24.6	7.34	2.59	4.8	-163	0.53	1.69	Clear
	03/29/2011		24.6	7.50	2.09	4.9	-59	0.49	1.34	Clear
	04/07/2011		25.3	7.47	2.47	2.2	-141	0.17	1.61	Clear
	04/18/2011		24.9	7.43	2.06	11.8	-146	0.54	1.35	Clear
	07/07/2011		26.1	7.15	2.59	1.6	-125	0.23	1.68	Clear
	08/01/2011		26.3	7.81	2.14	1.3	-53	0.23	1.38	Clear
	10/25/2011		25.7	7.07	2.38	0.8	-274	0.10	1.55	Clear
	02/16/2012		24.2	7.25	1.03	3.9	-229	0.30	0.89	Clear
	06/26/2012		24.5	6.72	1.45	0.6	-167	0.16	0.95	Clear
	09/13/2012		26.4	7.61	0.99	5.6	-16	0.41	0.65	Clear
LC34-BW0001D	02/01/2011	44 to 47	25.2	7.36	3.19	4.9	-122	0.36	2.07	Clear
	04/18/2011		25.6	7.37	2.75	3.9	-123	0.32	1.79	Clear
	07/07/2011		25.6	7.33	2.96	4.5	-101	0.24	1.92	Clear
	08/01/2011		27.0	7.64	2.00	4.2	-37	0.24	1.32	Clear
	10/25/2011		25.7	7.10	2.76	4.4	-302	0.35	1.79	Clear
	02/16/2012		25.4	6.73	2.92	7.9	-251	0.36	1.90	Clear
	06/26/2012		24.5	6.85	2.67	1.0	-223	0.16	1.73	Clear
	09/13/2012		25.7	6.99	3.79	17.3	-283	1.62	2.46	Cloudy

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-BW0001E	02/01/2011	51 to 54	24.9	7.69	2.71	9.7	-150	0.37	1.76	Clear
	03/22/2011		24.5	7.60	2.39	5.7	-155	0.35	1.55	Clear
	03/29/2011		25.1	7.64	2.57	8.7	-65	0.41	1.61	Clear
	04/07/2011		24.8	7.71	2.51	5.1	-139	0.15	1.63	Clear
	04/18/2011		24.7	7.69	2.37	12.0	-154	0.33	1.54	Clear
	07/07/2011		25.6	7.60	2.58	3.9	-145	0.17	1.68	Clear
	08/01/2011		27.4	7.32	1.99	4.5	-32	1.25	1.25	Clear
	10/25/2011		25.8	7.48	2.69	0.5	-281	0.20	1.75	Clear
	02/16/2012		25.2	7.47	2.52	2.3	-300	0.26	1.64	Clear
	06/26/2012		24.7	7.13	2.39	1.4	-215	0.21	1.55	Clear
09/13/2012	26.2	7.54	3.34	7.1	-274	1.43	2.17	Cloudy		
LC34-BW0001F	02/01/2011	58 to 61	24.9	7.64	2.81	8.6	-152	0.37	1.83	Clear
	04/18/2011		25.0	7.65	2.47	3.9	-119	0.49	1.61	Clear
	08/01/2011		26.0	7.80	2.05	4.2	-43	0.89	1.32	Clear
	10/25/2011		25.6	7.49	2.67	1.4	-188	0.30	1.74	Clear
	02/16/2012		25.1	7.25	2.53	0.9	-287	0.30	1.64	Clear
	06/26/2012		24.7	7.05	2.44	0.6	-167	0.27	1.53	Clear
	09/13/2012		26.2	7.15	2.52	6.6	-175	0.47	1.65	Clear
LC34-BW0002A	02/01/2011	23 to 26	24.7	7.44	1.28	1.4	-170	0.19	0.84	Clear
	04/19/2011		24.5	7.49	0.67	8.4	-175	0.20	0.43	Clear
	08/02/2011		26.4	7.87	1.00	4.7	-11	0.65	0.65	Clear
	10/26/2011		25.8	7.18	1.30	2.5	-184	0.31	0.85	Clear
	02/15/2012		25.4	7.37	2.11	4.5	-299	0.17	1.39	Clear
	06/26/2012		25.1	7.35	0.68	2.7	-189	0.23	0.44	Clear
	09/11/2012		26.2	7.13	0.96	0.6	72	0.70	0.63	Clear
LC34-BW0002B	02/01/2011	30 to 33	24.7	7.56	2.11	3.7	-183	0.30	1.38	Clear
	04/19/2011		25.0	7.50	0.90	5.8	-186	0.20	0.59	Clear
	08/02/2011		26.5	7.50	1.61	9.7	-13	1.04	1.04	Clear
	10/26/2011		25.5	7.34	1.19	3.2	-237	0.35	0.77	Clear
	02/15/2012		25.4	7.26	0.79	6.5	-213	0.22	0.48	Clear
	06/26/2012		25.2	7.46	0.70	2.0	-253	0.20	0.46	Clear
	09/11/2012		26.0	7.23	0.95	1.0	-20	0.30	0.61	Cloudy

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-BW0002C	02/01/2011	37 to 40	24.7	7.69	2.62	0.0	-197	0.37	1.71	Clear
	03/22/2011		24.6	7.71	2.56	7.5	-210	0.36	1.66	Clear
	03/29/2011		23.6	7.31	2.49	5.1	-60	0.62	1.62	Clear
	04/07/2011		24.8	7.75	2.48	11.6	-149	0.25	1.62	Clear
	04/19/2011		25.2	7.60	2.10	5.3	-203	0.27	1.37	Clear
	07/07/2011		26.5	7.53	2.42	6.1	-255	0.16	1.58	Clear
	08/02/2011		26.2	7.24	2.61	4.3	-15	0.97	1.77	Clear
	10/26/2011		25.4	7.38	2.52	0.8	-330	0.15	1.64	Clear
	02/14/2012		25.2	7.45	0.66	1.2	-161	0.10	0.43	Clear
	06/26/2012		26.0	7.28	2.11	2.4	-364	0.19	1.35	Clear
09/11/2012	25.9	7.44	2.49	0.9	-251	0.30	1.62	Clear		
LC34-BW0002D	02/01/2011	44 to 47	24.3	7.61	2.68	0.0	-154	0.35	1.77	Clear
	04/19/2011		25.1	7.68	2.05	2.6	-211	0.24	1.33	Clear
	07/07/2011		26.4	7.39	2.43	11.7	-161	0.20	1.58	Clear
	08/02/2011		26.4	7.68	2.37	1.2	-13	0.24	1.21	Clear
	10/26/2011		25.3	7.56	2.76	0.7	-338	0.77	1.80	Clear
	02/14/2012		25.2	7.41	2.67	1.4	-288	0.09	1.74	Clear
	06/26/2012		26.0	7.30	2.58	4.3	-361	0.10	1.65	Clear
	09/11/2012		26.9	7.69	3.31	5.5	-325	1.77	2.19	Cloudy
LC34-BW0002E	02/01/2011	51 to 54	23.7	7.58	2.60	7.5	-154	0.41	1.74	Clear
	04/19/2011		25.3	7.66	2.06	18.7	-187	0.08	1.34	Clear
	07/07/2011		25.6	7.77	2.58	5.6	-229	0.12	1.68	Clear
	08/02/2011		26.9	7.61	2.04	12.9	-3	0.33	1.34	Clear
	10/26/2011		26.1	7.77	2.66	1.8	-251	0.20	1.73	Clear
	02/14/2012		25.4	7.65	2.55	1.0	-266	0.09	1.66	Clear
	06/26/2012		25.1	7.61	2.40	1.3	-274	0.15	1.60	Clear
	09/11/2012		26.2	7.74	3.21	2.7	-236	1.44	2.09	Cloudy
LC34-BW0002F	02/01/2011	58 to 61	22.9	7.37	2.68	2.2	-109	0.52	1.82	Clear
	04/19/2011		25.2	7.63	2.14	2.2	-155	0.16	1.39	Clear
	08/02/2011		26.6	7.71	2.19	7.0	-16	0.54	1.45	Clear
	10/26/2011		26.3	7.69	2.73	0.4	-220	0.24	1.78	Clear
	02/14/2012		25.0	7.71	2.59	0.8	-204	0.11	1.68	Clear
	06/26/2012		24.9	7.57	2.53	1.4	-258	0.12	1.64	Clear
	09/11/2012		26.2	7.82	3.30	1.9	-286	0.71	2.15	Clear

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-BW0003A	02/01/2011	23 to 26	24.3	7.43	1.44	10.3	-152	0.35	0.95	Clear
	04/19/2011		24.4	7.43	0.72	0.5	-180	1.16	0.47	Clear
	08/02/2011		25.8	7.86	1.30	2.9	-170	2.13	0.85	Clear
	10/26/2011		26.4	7.23	0.85	1.8	-252	0.80	0.56	Clear
	02/15/2012		24.8	7.47	0.76	2.1	-150	0.18	0.49	Clear
	06/27/2012		24.5	7.52	0.71	0.4	-175	0.61	0.46	Clear
	09/11/2012		26.6	7.41	0.90	0.4	-87	2.32	0.58	Clear
LC34-BW0003B	02/01/2011	30 to 33	24.4	7.66	1.89	13.4	-196	0.22	1.25	Clear
	04/19/2011		24.5	7.48	0.82	3.8	-176	0.34	0.53	Clear
	08/02/2011		25.8	7.53	1.83	1.0	-167	2.35	1.19	Clear
	10/27/2011		25.2	7.30	0.95	1.4	-238	0.78	0.61	Clear
	02/15/2012		25.2	7.52	0.80	2.4	-161	0.21	0.52	Clear
	06/27/2012		24.4	7.54	0.73	0.5	-169	0.21	0.47	Clear
	09/11/2012		26.0	7.28	0.89	0.6	-104	1.49	0.58	Clear
LC34-BW0003C	02/02/2011	37 to 40	23.9	7.73	2.42	7.0	-143	0.20	1.60	Clear
	03/22/2011		24.2	7.56	2.20	2.7	-181	0.24	1.43	Clear
	03/29/2011		23.6	7.50	2.50	8.9	-92	0.42	1.62	Clear
	04/07/2011		24.7	7.70	2.16	2.8	-168	0.12	1.40	Clear
	04/19/2011		24.8	7.56	1.60	6.1	-177	0.19	1.04	Clear
	07/07/2011		25.2	7.26	2.02	18.4	-123	0.21	1.31	Clear
	08/02/2011		26.2	6.88	3.07	3.2	-276	1.26	1.99	Clear
	10/27/2011		25.6	7.32	1.75	2.7	-282	0.36	1.14	Clear
	02/15/2012		25.0	7.50	1.19	7.9	-199	0.17	0.84	Clear
	06/27/2012		24.6	7.61	1.09	0.5	-248	0.30	0.71	Clear
09/13/2012	25.6	7.65	1.16	1.6	-141	3.09	0.76	Clear		
LC34-BW0003D	02/02/2011	44 to 47	24.0	7.71	2.59	5.1	-115	0.21	1.71	Clear
	04/19/2011		24.8	7.51	1.86	11.1	-177	0.31	1.21	Clear
	07/07/2011		25.7	5.74	2.12	13.1	13	0.42	1.41	Clear
	08/02/2011		27.1	6.95	2.98	5.0	-268	1.24	1.94	Clear
	10/26/2011		25.8	6.43	2.61	6.8	-292	0.60	1.70	Clear
	02/15/2012		25.0	6.90	2.53	5.1	-314	0.19	1.65	Clear
	06/27/2012		25.1	7.28	2.42	7.8	-346	0.56	1.57	Clear
	09/13/2012		25.8	7.28	3.13	1.3	-268	1.35	2.03	Cloudy

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-BW0003E	02/01/2011	51 to 54	24.2	7.65	2.63	2.9	-149	0.32	1.74	Clear
	03/22/2011		24.4	7.56	2.37	5.9	-159	0.25	1.54	Clear
	03/29/2011		24.0	7.71	2.12	6.6	-94	0.65	1.41	Clear
	04/07/2011		25.0	7.74	2.48	4.9	-136	0.17	1.61	Clear
	04/19/2011		24.6	7.59	1.87	5.0	-158	0.25	1.22	Clear
	07/07/2011		25.0	6.94	1.97	7.0	-128	0.22	1.28	Clear
	08/02/2011		25.6	7.10	2.94	1.2	-265	0.97	1.90	Clear
	10/26/2011		25.8	6.43	2.61	6.8	-292	0.60	1.70	Clear
	02/15/2012		25.1	6.84	2.56	2.3	-300	0.19	1.67	Clear
	06/27/2012		25.0	7.37	2.60	1.0	-289	0.70	1.69	Clear
09/13/2012	25.7	7.33	3.36	0.9	-238	1.73	2.18	Cloudy		
LC34-BW0003F	02/01/2011	58 to 61	24.3	7.61	2.80	2.4	-142	0.24	1.85	Clear
	04/19/2011		24.6	7.56	2.01	2.2	-133	0.22	1.30	Clear
	08/02/2011		25.6	7.80	2.78	1.3	-248	1.25	1.80	Clear
	10/27/2011		26.0	7.32	2.73	1.4	-287	0.34	1.78	Clear
	02/15/2012		24.9	6.88	2.61	1.0	-270	0.18	1.70	Clear
	06/27/2012		25.1	7.54	2.59	1.1	-285	0.33	1.69	Clear
	09/13/2012		25.8	7.54	3.46	5.3	-262	1.63	2.25	Cloudy
LC34-IW0002I	02/03/2011	25 to 30	24.0	7.30	1.25	10.3	-137	0.61	0.83	Clear
	03/22/2011		25.2	7.26	0.88	3.7	-146	0.61	0.57	Clear
	03/29/2011		24.8	7.63	2.35	4.7	-53	0.45	1.31	Clear
	04/07/2011		24.5	7.40	0.85	6.1	-138	0.35	0.55	Clear
	04/18/2011		24.4	7.44	0.73	5.1	-141	0.29	0.48	Clear
	08/01/2011		27.0	6.57	1.95	4.3	-143	0.91	1.27	Clear
	10/26/2011		26.0	6.99	0.78	9.5	-291	0.52	0.51	Clear
	02/15/2012		24.8	7.32	0.66	4.1	-729	0.86	0.43	Clear
	06/26/2012		25.3	6.86	0.60	3.2	-80	0.32	0.39	Clear
	09/13/2012		26.4	7.63	0.51	10.9	-118	0.77	0.33	Clear

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-IW0002D	02/02/2011	35 to 40	24.6	7.38	2.81	6.0	-95	0.42	1.84	Clear
	03/22/2011		24.8	7.40	1.96	7.2	-144	0.48	1.28	Clear
	03/28/2011		23.3	7.46	1.90	5.5	-149	0.69	1.23	Clear
	04/07/2011		24.6	7.58	1.81	1.7	-153	0.27	1.18	Clear
	04/18/2011		25.9	7.80	1.24	3.8	-162	0.36	0.81	Clear
	08/01/2011		26.9	6.83	3.66	4.7	-211	0.76	2.38	Clear
	10/26/2011		26.5	6.92	2.29	1.6	-312	0.61	1.40	Clear
	2/16/2012		25.4	6.99	1.25	4.0	-243	0.33	0.81	Clear
	06/26/2012		25.3	7.32	0.88	1.5	-307	0.29	0.60	Clear
09/13/2012	26.1	7.76	0.72	6.6	-157	0.56	0.50	Clear		
LC34-IW0002D1	02/02/2011	50 to 55	24.6	7.70	2.94	6.2	-90	0.49	1.93	Clear
	03/22/2011		24.6	7.56	2.50	8.3	-121	0.39	1.62	Clear
	03/28/2011		23.8	7.59	2.63	7.5	-109	0.43	1.71	Clear
	04/07/2011		24.1	7.68	2.59	5.2	-127	0.29	1.69	Clear
	04/18/2011		25.2	7.83	1.97	6.8	-119	0.39	1.28	Clear
	08/01/2011		26.5	7.11	2.90	14.8	-250	0.53	1.89	Clear
	10/26/2011		26.6	7.57	2.73	7.1	-302	0.27	1.77	Clear
	02/16/2012		25.1	7.07	2.59	3.8	-308	0.31	1.69	Clear
	06/26/2012		25.5	7.29	2.37	2.3	-364	0.27	1.56	Clear
09/13/2012	26.0	7.77	2.34	2.9	-276	0.23	1.59	Clear		
LC34-IW0067D	02/02/2011	38 to 43	25.0	7.74	3.00	4.1	-249	0.32	1.95	Clear
	04/18/2011		25.8	7.89	1.94	5.4	-272	0.35	1.26	Clear
	10/25/2011		26.0	7.51	2.61	7.3	-245	0.09	1.70	Clear
	02/14/2012		24.3	8.52 *	2.54	1.6	-240	0.33	1.65	Clear
	06/26/2012		25.5	7.52	2.66	3.0	-298	0.17	1.73	Clear
LC34-IW0067D1	02/03/2011	63 to 73	24.6	7.53	2.73	13.6	-99	0.30	1.79	Clear
	04/18/2011		25.9	7.76	1.96	17.2	-154	0.38	1.28	Clear
	10/25/2011		25.9	7.50	2.66	74.8	-142	0.13	1.73	Cloudy
	02/14/2012		24.1	7.63 *	2.58	9.7	-60	0.39	1.67	Clear
	06/26/2012		25.2	7.41	2.67	125.0	-146	0.14	1.74	White and cloudy

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-IW0070D	02/02/2011	38 to 43	25.1	7.74	3.08	2.4	-242	0.46	2.00	Clear
	04/18/2011		25.3	7.83	1.90	6.0	-220	0.43	1.24	Clear
	10/25/2011		26.2	7.64	2.67	4.3	-281	0.08	1.74	Clear
	02/15/2012		25.2	7.73	2.54	5.7	-170	0.30	1.65	Clear
	06/26/2012		25.4	7.49	2.71	3.8	-281	0.42	1.77	Clear
LC34-IW0070D1	02/02/2011	65 to 75	24.7	7.69	3.10	3.5	-151	0.38	2.03	Clear
	04/18/2011		25.7	7.80	2.02	13.7	-123	0.47	1.31	Clear
	10/25/2011		26.1	7.56	2.69	8.0	-185	0.10	1.75	Clear
	02/15/2012		25.0	7.67	2.57	3.0	-24	0.31	1.67	Clear
	06/26/2012		25.0	7.42	2.69	3.1	-90	0.42	1.75	Clear
LC34-IW0071D	02/02/2011	38 to 43	23.1	7.54	2.33	1.0	-137	0.17	1.57	Clear
	04/18/2011		24.7	7.91	1.84	0.7	-172	0.68	1.19	Clear
	10/25/2011		24.3	7.54	2.39	1.1	-222	0.12	1.56	Clear
	02/15/2012		23.4	7.66	2.28	0.6	-88	0.31	1.48	Clear
	06/26/2012		24.0	7.42	2.49	1.6	-242	0.13	1.62	Clear
LC34-IW0071D1	02/02/2011	65 to 75	23.0	7.65	2.47	0.7	-112	0.19	1.67	Clear
	04/18/2011		25.0	7.82	1.92	7.6	-124	0.34	1.25	Clear
	10/25/2011		24.5	7.58	2.55	4.2	-161	0.09	1.66	Clear
	02/14/2012		23.2	7.63	2.49	1.8	-73	0.27	1.62	Clear
	06/26/2012		24.0	7.42	2.63	1.6	-151	0.15	1.71	Clear
LC34-IW0076	02/02/2011	70 to 80	24.3	7.69	2.95	15.6	0	1.95	1.95	Clear
	04/18/2011		25.2	7.83	2.38	7.9	-182	0.22	1.55	Clear
	08/01/2011		25.9	7.78	2.53	14.4	-152	1.79	1.64	Clear
	10/25/2011		27.0	7.43	2.60	38.7	-200	0.07	1.69	Cloudy
	02/15/2012		24.6	7.12	2.39	16.4	-63	0.51	1.56	Clear
	06/26/2012		28.2	6.60	2.34	5.9	-207	0.48	1.55	Clear
	09/13/2012		26.3	7.80	2.54	6.9	-140	0.49	1.67	Clear

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-RW0007	02/02/2011	35 to 42	24.1	7.90	2.69	10.0	7	0.16	1.78	Clear
	03/22/2011		24.2	7.40	2.28	3.0	-109	2.34	1.48	Clear
	03/28/2011		23.2	7.43	2.60	3.7	-136	1.69	1.69	Clear
	04/07/2011		24.2	7.57	2.35	0.8	-154	0.38	1.52	Clear
	04/19/2011		24.7	7.42	1.90	1.4	-166	0.41	1.24	Clear
	07/07/2011		25.3	7.22	2.20	4.3	-124	0.27	1.43	Clear
	08/01/2011		26.6	6.98	2.74	3.6	-208	0.39	1.78	Clear
	08/12/2011		26.5	8.21	1.83	4.8	-238	0.14	1.16	Clear
	08/18/2011		26.5	6.80	2.39	7.8	-280	0.49	1.55	Clear
	08/24/2011		26.7	6.75	2.73	1.8	-252	0.63	1.77	Clear
	08/31/2011		26.5	7.34	2.58	1.6	-290	0.17	1.63	Clear
	09/15/2011		27.1	7.06	2.66	0.8	-303	1.67	1.73	Clear
	09/28/2011		26.4	7.11	2.45	1.6	-284	0.66	1.60	Clear
	10/13/2011		25.7	7.15	2.49	2.3	-315	0.20	1.62	Clear
	10/26/2011		25.3	7.04	1.22	0.6	-314	1.19	0.79	Clear
	11/10/2011		25.3	7.26	2.45	1.5	-333	0.21	1.59	Clear
	11/22/2011		25.6	7.19	2.46	0.8	-539	0.15	1.60	Clear
	12/15/2011		25.0	7.18	2.06	1.0	-320	0.12	1.34	Clear
	01/05/2012		23.2	7.11	1.40	3.0	-255	0.50	0.91	Clear
	01/26/2012		24.5	7.23	1.99	0.8	-260	1.06	1.29	Clear
	02/14/2012		24.0	8.84 *	2.03	0.7	-252	0.53	1.32	Clear
	03/15/2012		25.7	7.78	0.79	5.6	-222	0.32	0.52	Clear
	04/19/2012		24.7	7.46	2.04	3.6	-234	1.10	1.33	Clear
	05/17/2012		24.1	10.54 J	2.09	1.3	-312	1.58 J	1.36	Clear
06/26/2012	26.7	7.12	2.07	3.1	-286	0.33	1.35	Clear		
07/19/2012	25.6	7.39	1.94	0.1	-324	0.38	1.26	Clear		
08/16/2012	26.2	7.42	2.81	1.2	-324	0.09	1.83	Clear		
09/13/2012	26.5	7.85	0.92	2.9	-241	0.25	0.60	Clear		

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-RW0008	02/02/2011	47 to 57	24.5	8.76	2.30	11.0	-91	0.16	1.51	Clear
	03/22/2011		24.5	7.56	2.40	4.1	-102	1.02	1.56	Clear
	03/28/2011		23.2	7.60	2.56	7.9	-117	0.55	1.66	Clear
	04/07/2011		24.2	7.68	2.46	0.8	-113	0.61	1.60	Clear
	04/19/2011		25.2	7.68	1.93	1.9	-156	0.40	1.25	Clear
	07/07/2011		25.2	7.35	2.35	8.7	-209	0.27	1.53	Clear
	08/01/2011		26.3	7.32	2.53	3.3	-226	0.25	1.64	Clear
	08/12/2011		26.2	8.11	2.87	8.3	-262	0.26	1.82	Clear
	08/18/2011		26.5	6.98	2.66	3.7	-246	0.34	1.73	Clear
	08/24/2011		27.3	7.01	2.73	3.1	-250	0.52	1.78	Clear
	08/31/2011		26.6	7.80	2.65	2.5	-294	0.07	1.67	Clear
	09/15/2011		26.8	7.21	2.66	0.9	-320	1.03	1.73	Clear
	09/28/2011		26.4	7.21	2.47	1.3	-275	0.59	1.61	Clear
	10/13/2011		25.6	7.34	2.65	1.7	-305	0.21	1.72	Clear
	10/26/2011		24.9	7.20	2.66	1.7	-323	0.31	1.73	Clear
	11/10/2011		35.1	7.42	2.59	1.4	-349	0.21	1.68	Clear
	11/22/2011		25.7	7.31	2.58	0.8	-346	0.14	1.68	Clear
	12/15/2011		24.6	7.42	2.55	1.4	-329	0.15	1.66	Clear Grey
	01/05/2012		23.0	7.26	2.42	0.8	-284	0.50	1.57	Clear
	01/26/2012		24.5	7.36	2.35	0.6	-293	0.80	1.53	Clear
	02/14/2012		24.0	8.82 *	2.54	0.6	-255	0.49	1.65	Clear
	03/15/2012		25.9	7.52	2.49	0.8	-232	0.38	1.62	Clear
	04/19/2012		24.5	7.65	2.42	1.0	-220	1.08	1.57	Clear
	05/17/2012		23.8	10.69 J	2.47	2.4	-320	1.55 J	1.60	Clear
06/26/2012	25.5	7.07	2.70	2.5	-270	0.38	1.75	Clear		
07/19/2012	25.8	7.51	2.51	0.1	-306	0.32	1.63	Clear		
08/16/2012	25.7	7.64	3.64	1.6	-341	0.36	2.37	Clear		
09/13/2012	26.7	7.77	2.56	5.2	-240	0.40	1.67	Clear		

**Table E-1-9. Summary of Groundwater Sampling Results: Field Geochemical Parameters
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716**

Location	Sample Date	Screen Interval (ft BLS)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)	Total Dissolved Solids (g/L)	Color
LC34-IJ0015	02/03/2011	32 to 42	24.1	7.56	2.65	15.0	-162	0.26	1.76	Clear
LC34-IJ0016	02/03/2011	47 to 57	24.2	7.63	2.78	13.7	-133	0.28	1.84	Clear
LC34-IJ0019	02/03/2011	32 to 42	24.1	7.64	1.97	12.0	-160	0.31	1.30	Clear
LC34-IJ0020	02/03/2011	47 to 57	23.4	7.68	2.36	13.0	-121	0.35	1.58	Clear

Notes:

1. ft BLS indicates feet below land surface.
2. °C indicates degree Celsius.
3. pH is a measure of the activity of the hydrogen ion.
4. S.U. indicates standard units.
5. mS/cm indicates microSiemens per centimeter.
6. NTU indicates Nephelometric Turbidity Unit.
7. mV indicates millivolts.
8. mg/L indicates milligram per liter.
9. g/L indicates gram per liter.
10. * indicates malfunctioning of probe.
11. J indicates an estimated value (qualified with continuing calibration verification).
12. Results not displayed to a set number of significant digits.

Table E-1-10. Summary of Groundwater Sampling Results: *Dehalococcoides* and Vinyl Chloride Reductase

Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

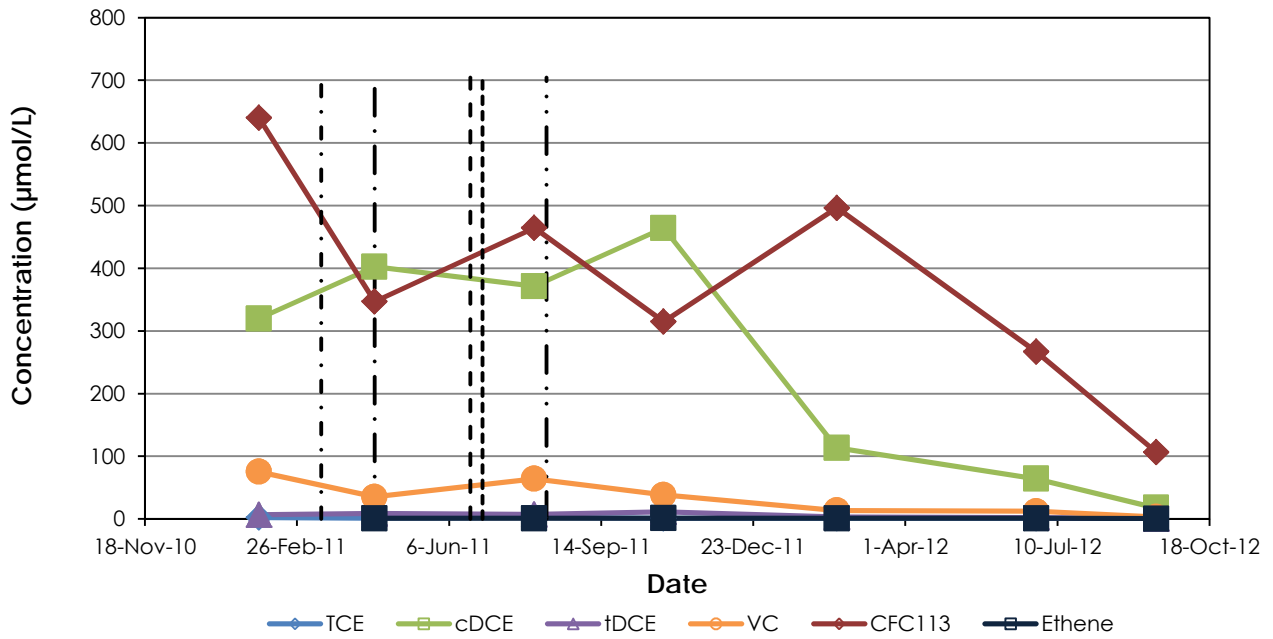
Location	Sample Date	Screen Interval (ft BLS)	<i>Dehalococcoides</i> (gene copies/L)	Vinyl Chloride Reductase (gene copies/L)
LC34-BW0001C	04/18/2011	37 to 40	7.0E+05	NA
	10/25/2011		6.0E+06	NA
	2/16/2012		6.0E+06	NA
	06/26/2012		1.0E+08	1.0E+08
	09/13/2012		1.0E+08	2.0E+08
LC34-BW0001E	04/18/2011	51 to 54	4.0E+03 U	NA
	10/25/2011		7.0E+06	NA
	2/16/2012		3.0E+07	NA
	06/26/2012		2.0E+07	2.0E+07
	09/13/2012		2.0E+07	3.0E+07
LC34-BW0003C	04/19/2011	37 to 40	5.0E+07	NA
	10/27/2011		5.0E+08	NA
	2/15/2012		3.0E+08	NA
	06/27/2012		2.0E+08	9.0E+07
	09/13/2012		1.0E+08	1.0E+08
LC34-BW0003E	04/19/2011	51 to 54	1.0E+03 J	NA
	10/27/2011		2.0E+06	NA
	2/15/2012		1.0E+06	NA
	06/27/2012		3.0E+06	8.0E+06
	09/13/2012		2.0E+06	5.0E+06
LC34-RW0007	04/19/2011	35 to 42	1.0E+05	5.0E+03
	10/26/2011		1.0E+08	2.0E+06
	2/14/2012		2.0E+08	3.0E+07
	06/26/2012		2.0E+07	2.0E+07
	09/13/2012		2.0E+07	1.0E+07
LC34-RW0008	04/19/2011	47 to 57	3.0E+04	4.0E+03 U
	10/26/2011		3.0E+08	5.0E+07
	2/14/2012		1.0E+08	3.0E+07
	06/26/2012		9.0E+07	1.0E+08
	09/13/2012		6.0E+07	6.0E+07

Notes:

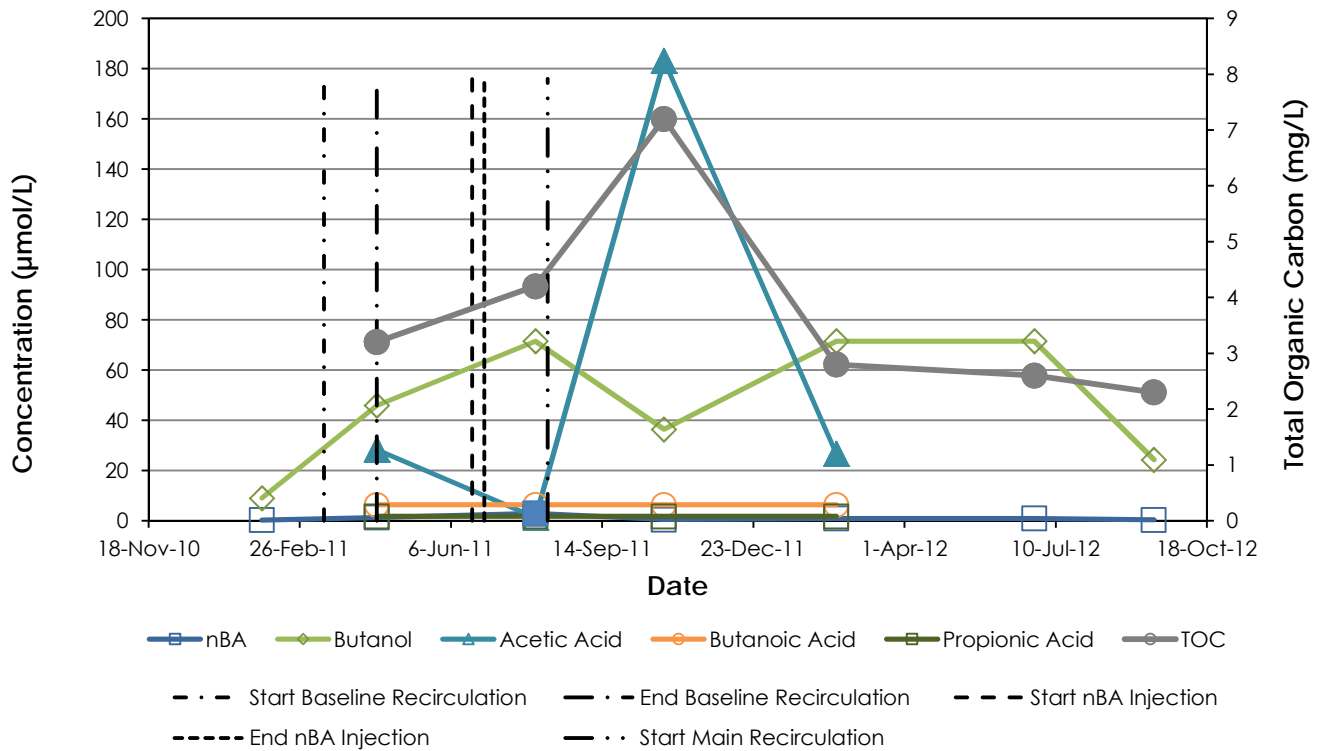
1. ft BLS indicates feet below land surface.
2. gene copies/L indicates gene copies per liter.
3. U indicates not detected, associated value is the quantitation limit.
4. J indicates values is between the method detection limit and the quantitation limit.
5. NA indicates not analyzed.
6. **Bold** indicates the result was detected above method detection limit (MDL).
7. Results not displayed to a set number of significant digits.

ATTACHMENT E-2
TIME-TREND PLOTS OF DATA BY WELL

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,1-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001A - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



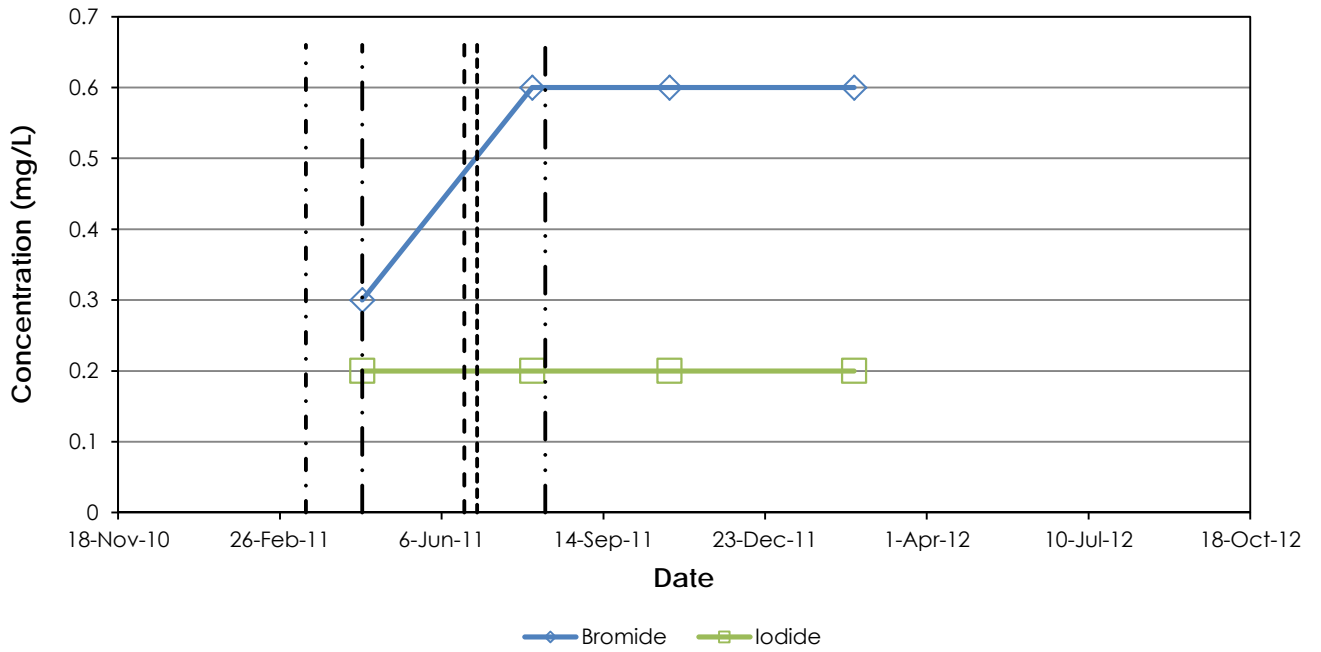
Figure

E-2-1a

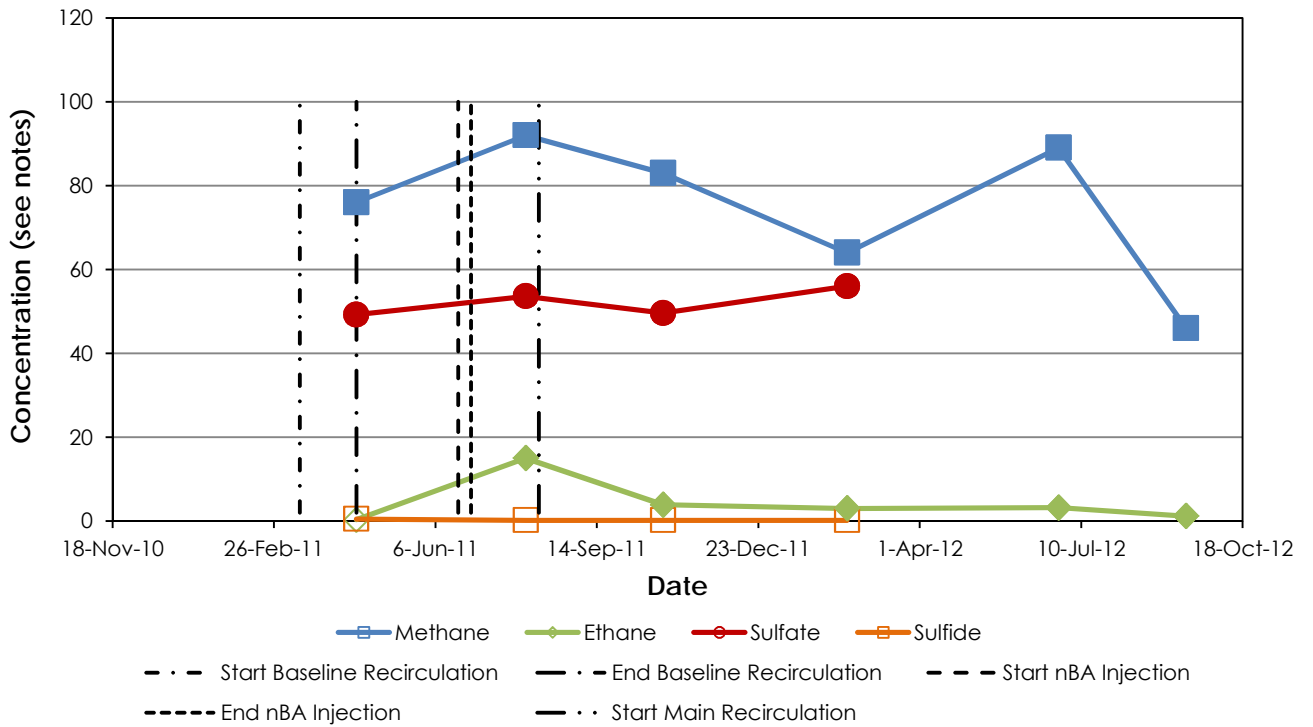
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001A - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



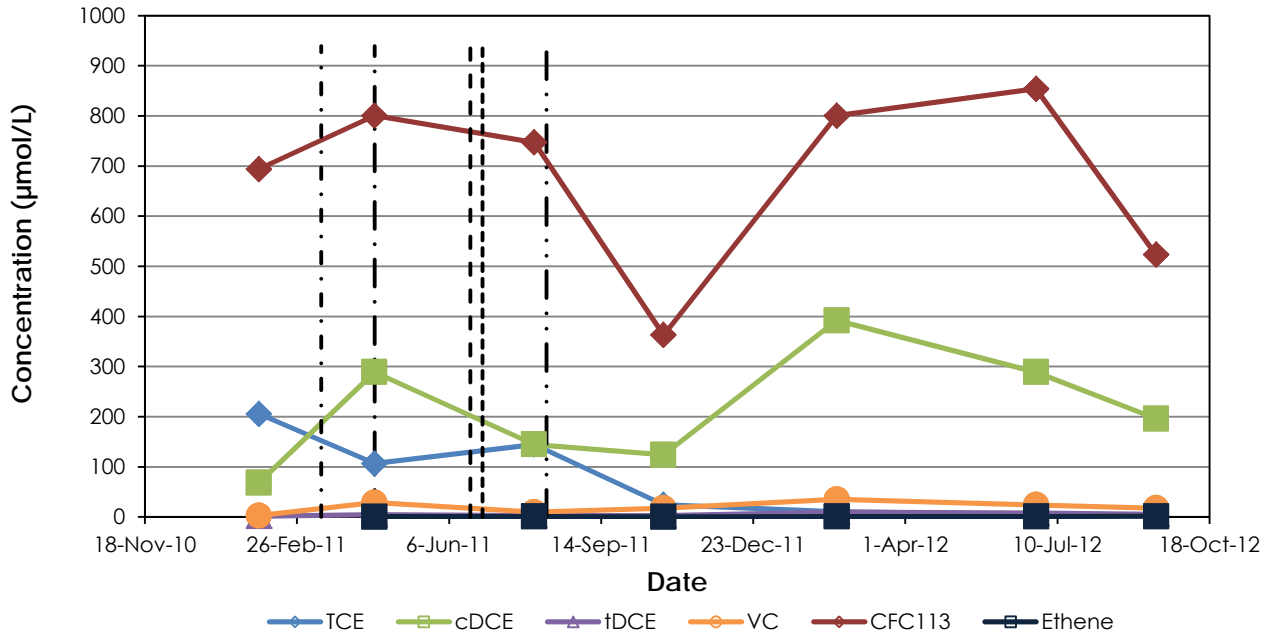
Figure

E-2-1b

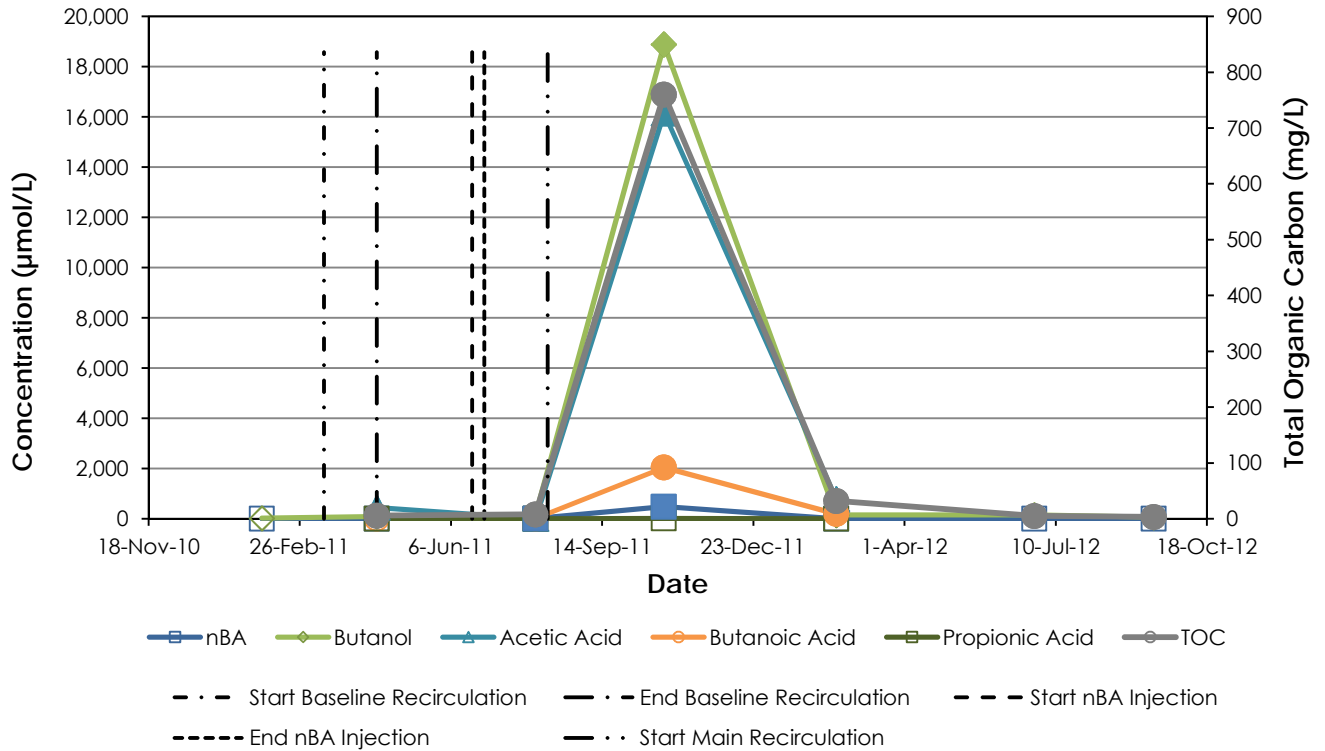
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



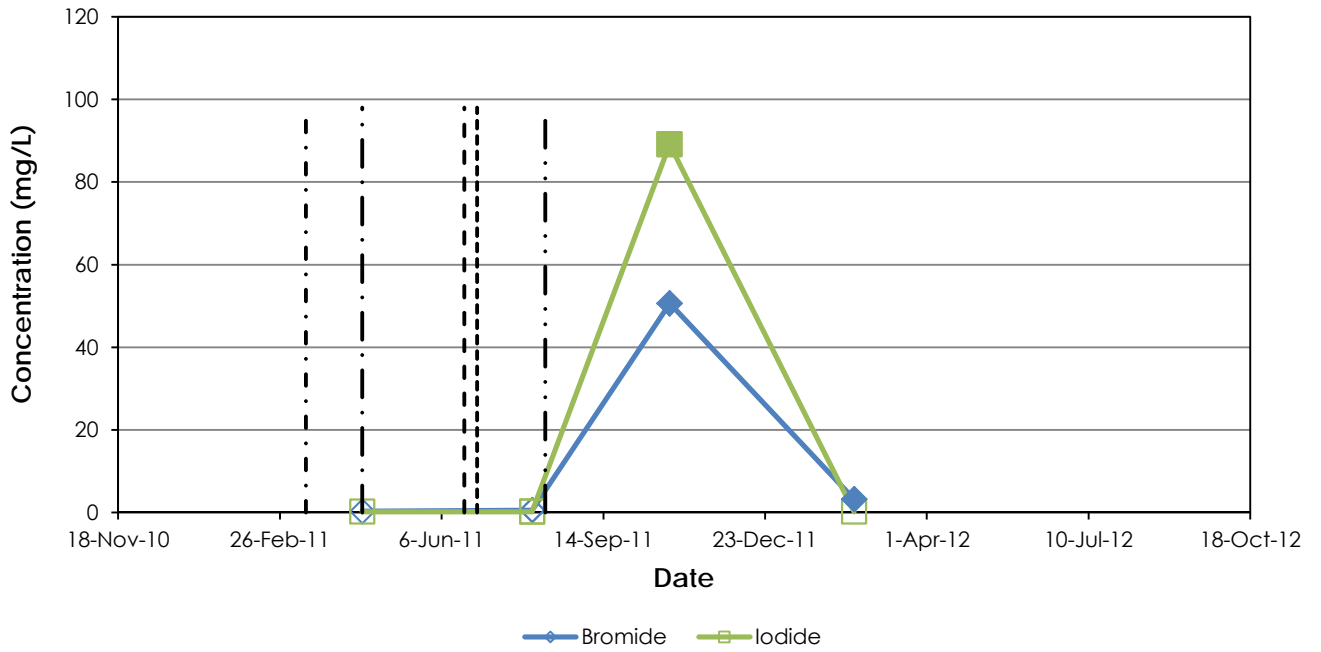
Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

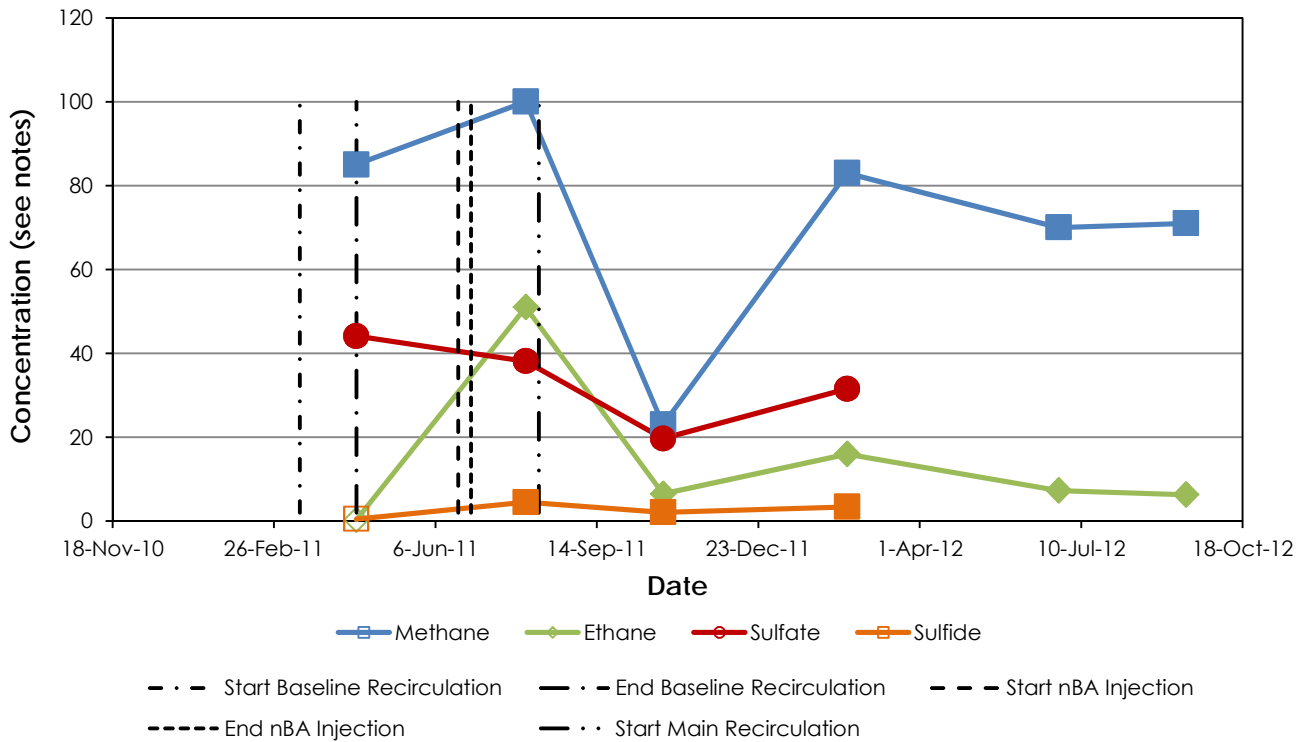
BW0001B - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-2a	

\\Guelph-01\Data\PRJ\Projects\TR0272 - ESTCP_PED\12 Field Demo - LC54\DATA\07 Database & GIS\GuelphOutput\TimeTrendsPlots_20130118\BW001B.xlsx[Plot 1

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001B - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



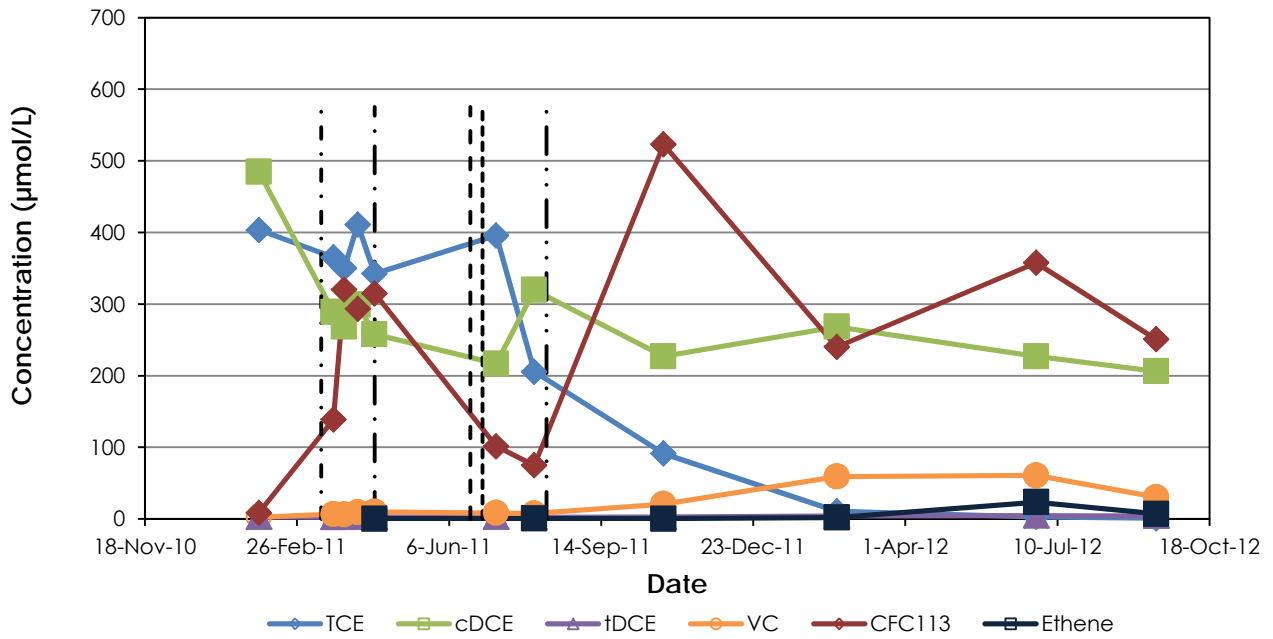
Figure

E-2-2b

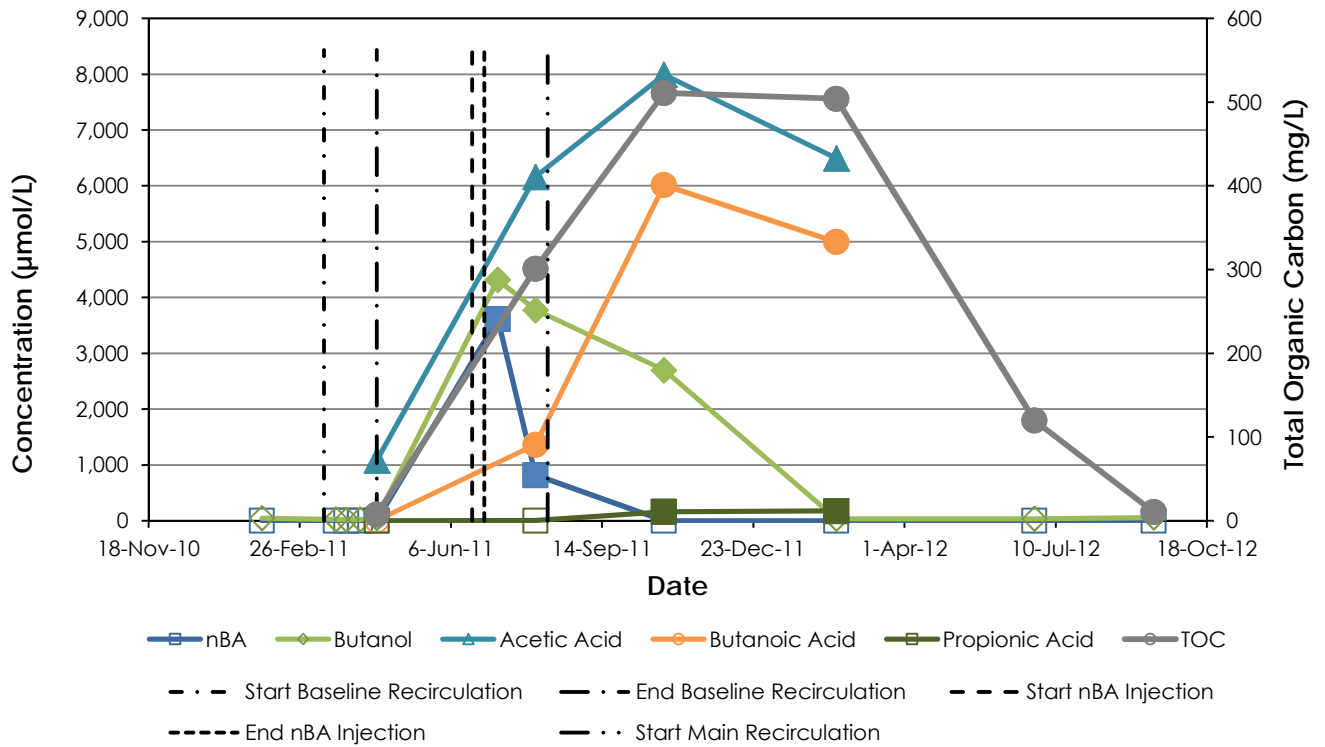
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

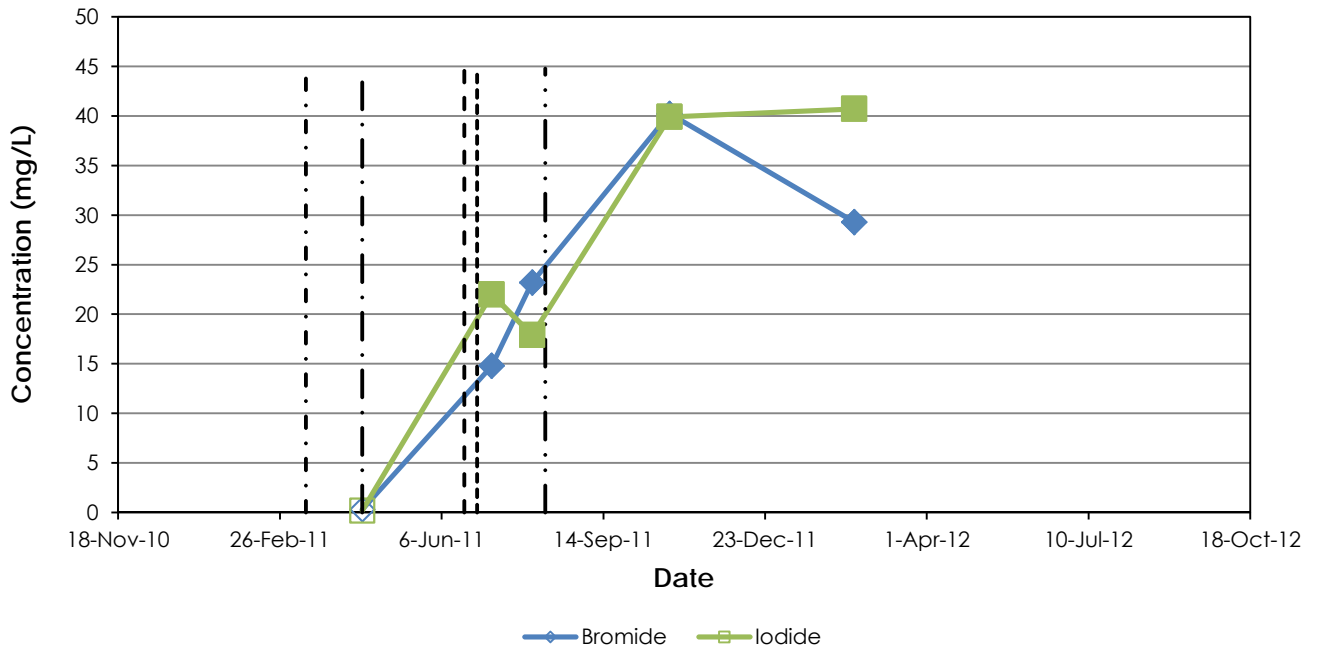


Notes:

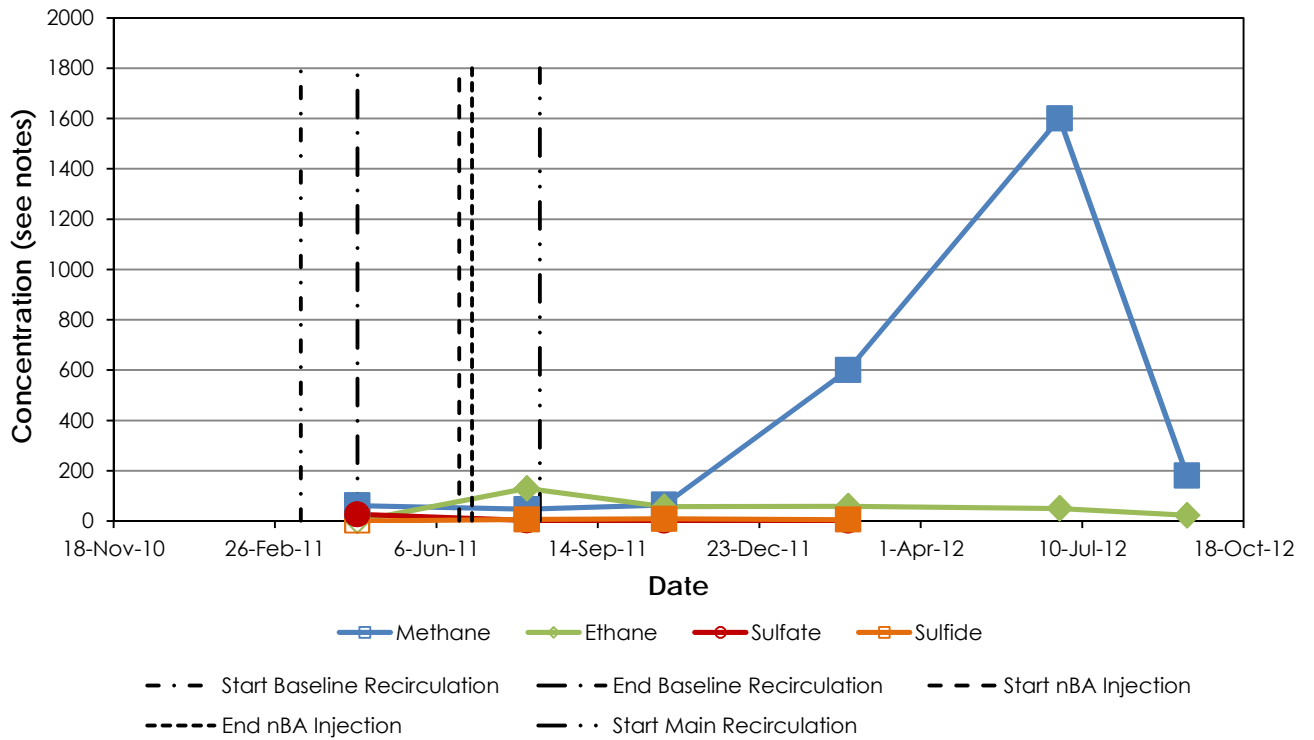
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001C - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-3a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001C - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



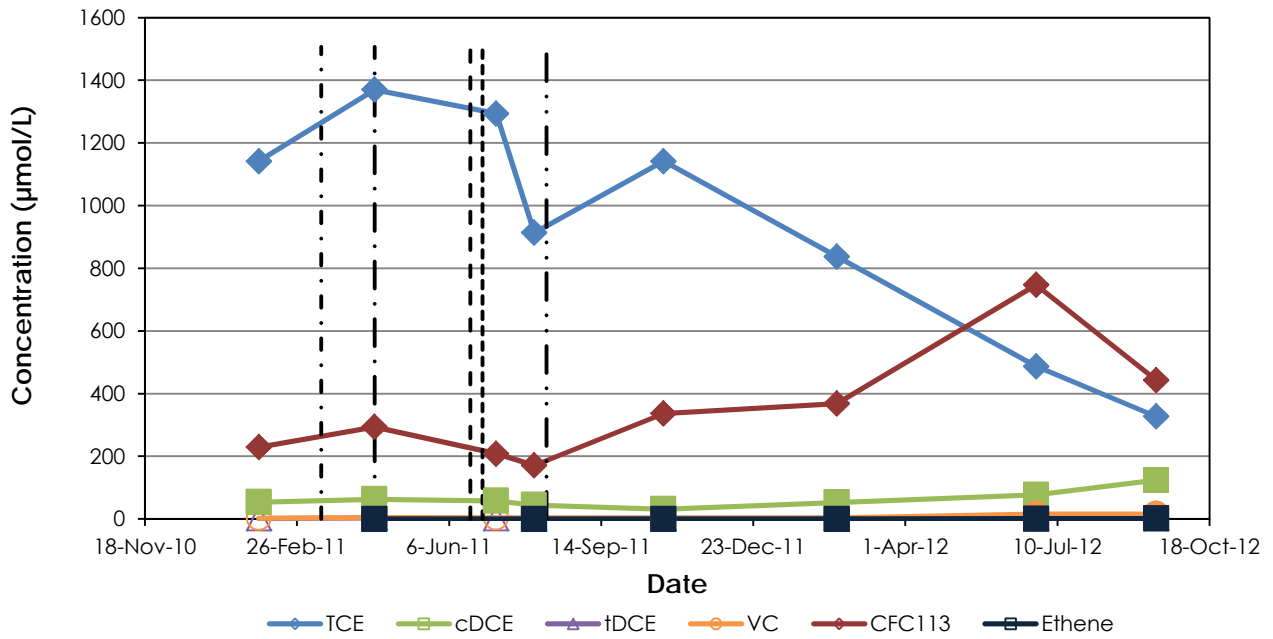
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E-2-3b

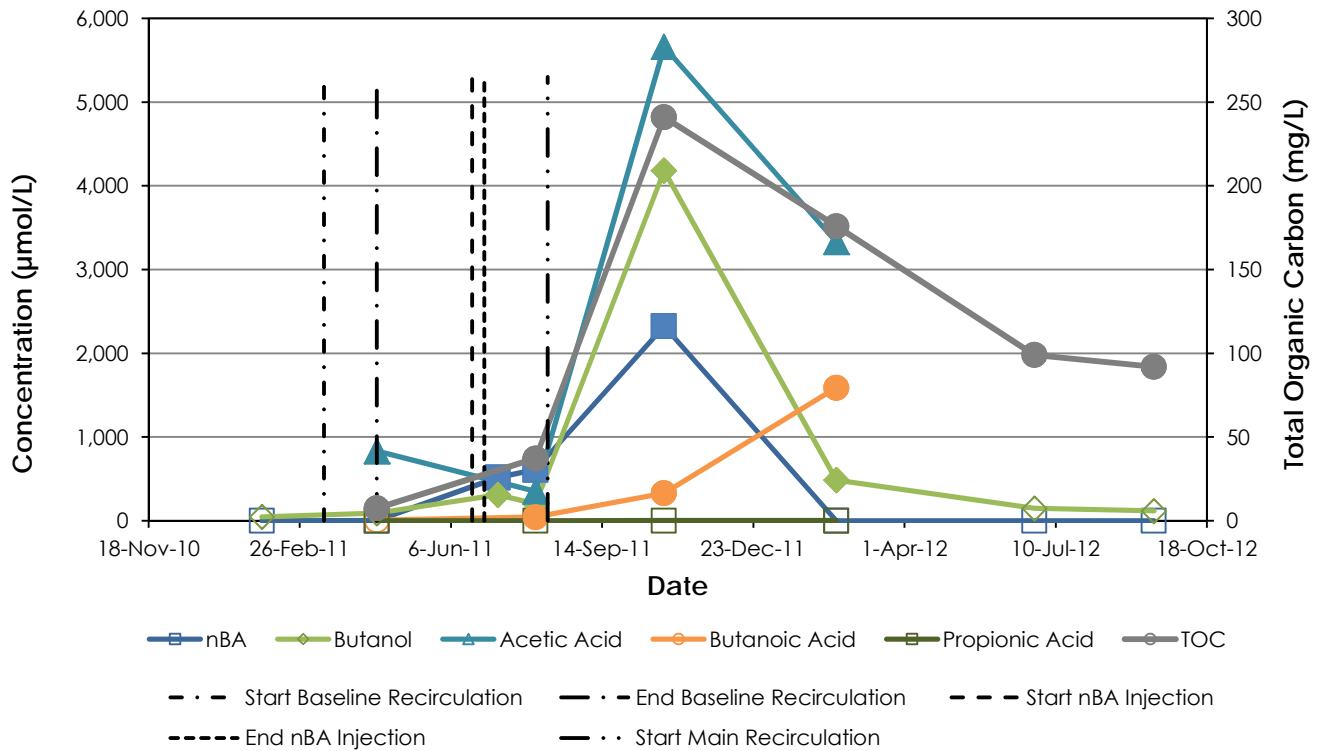
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001D - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



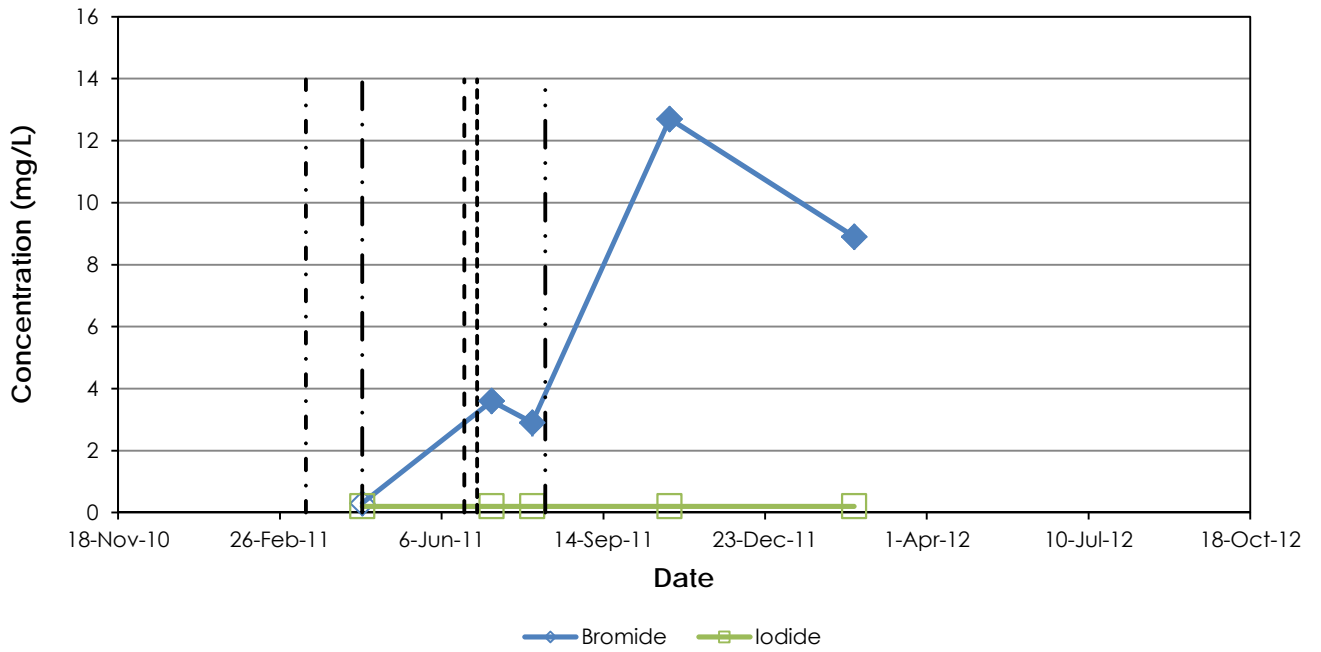
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E-2-4a

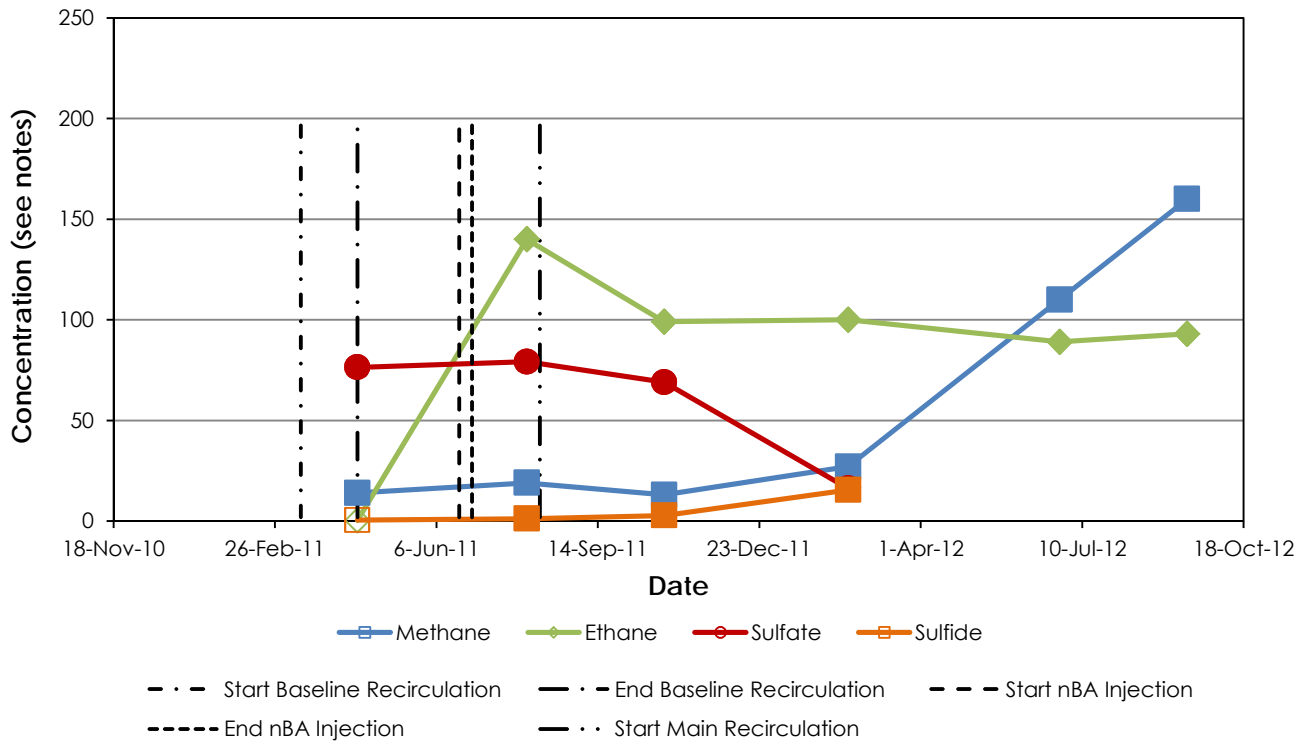
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001D - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



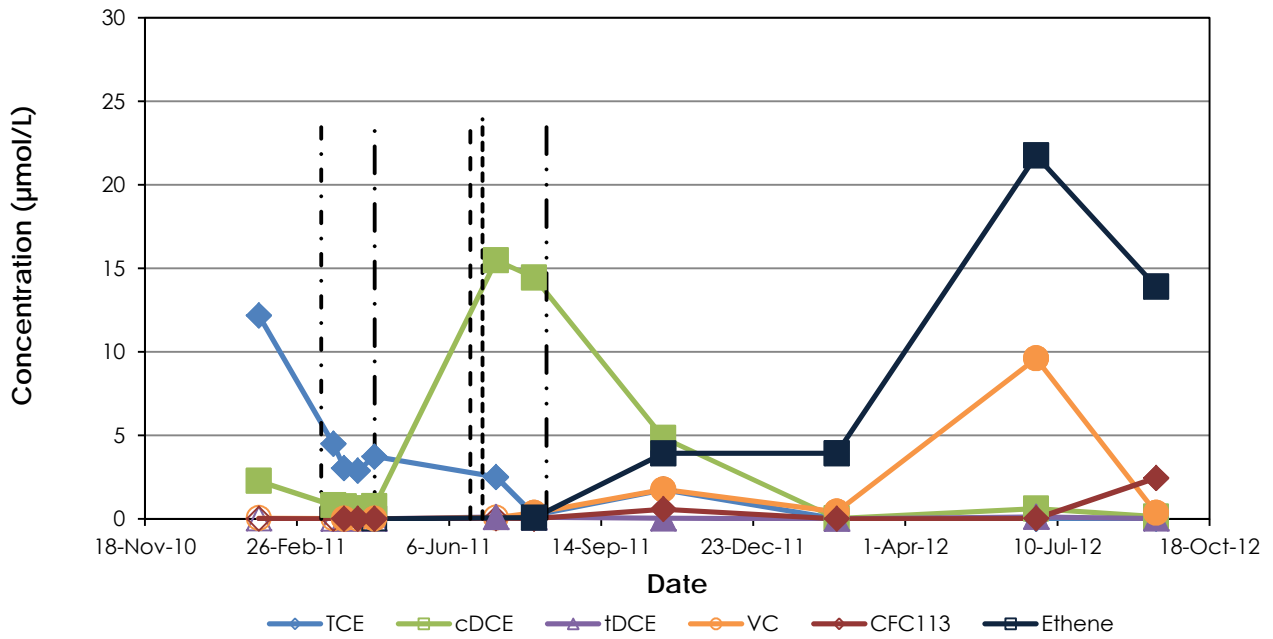
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E-2-4b

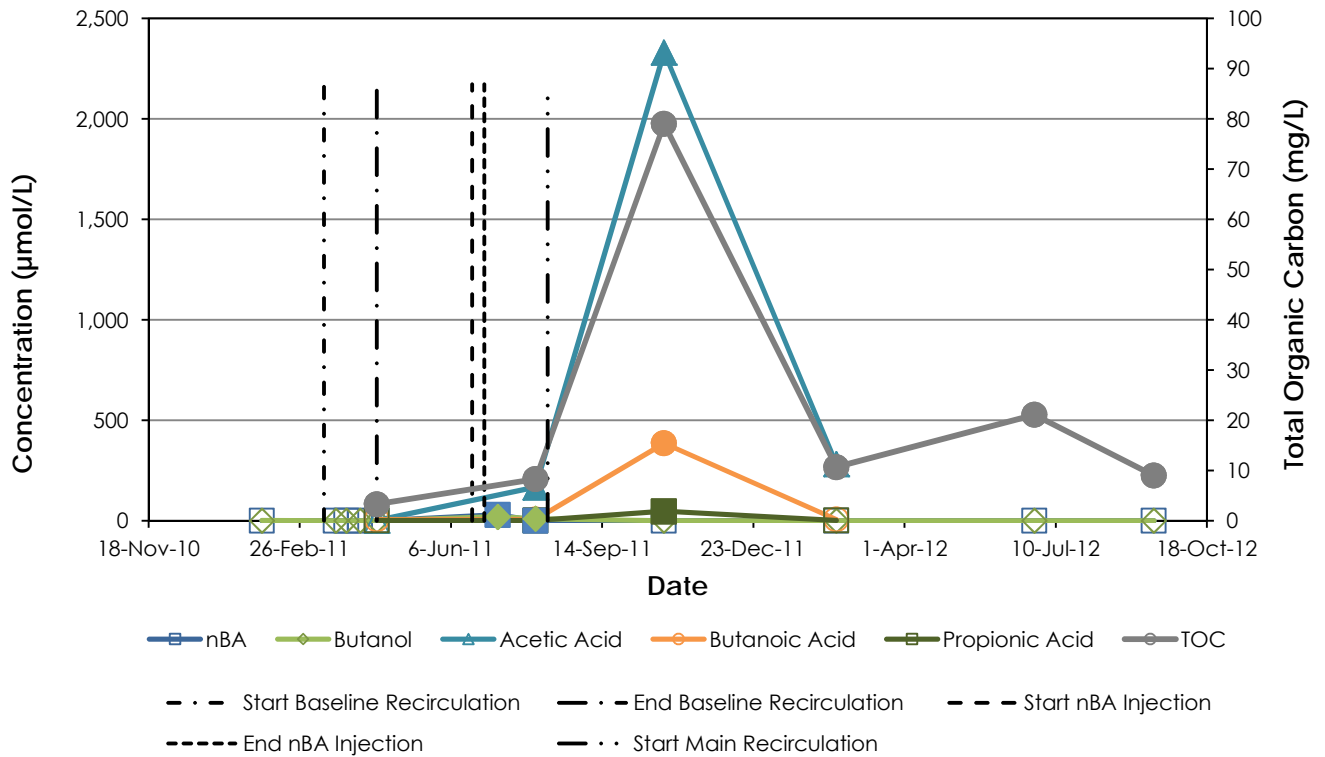
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

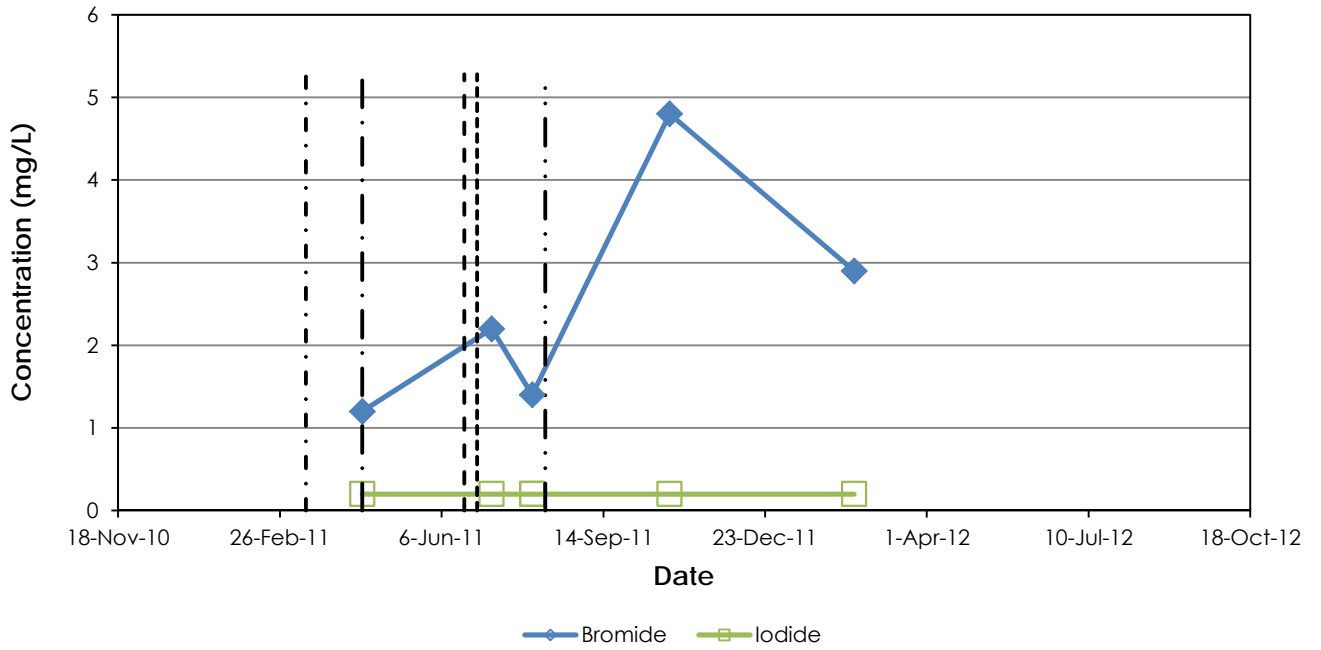


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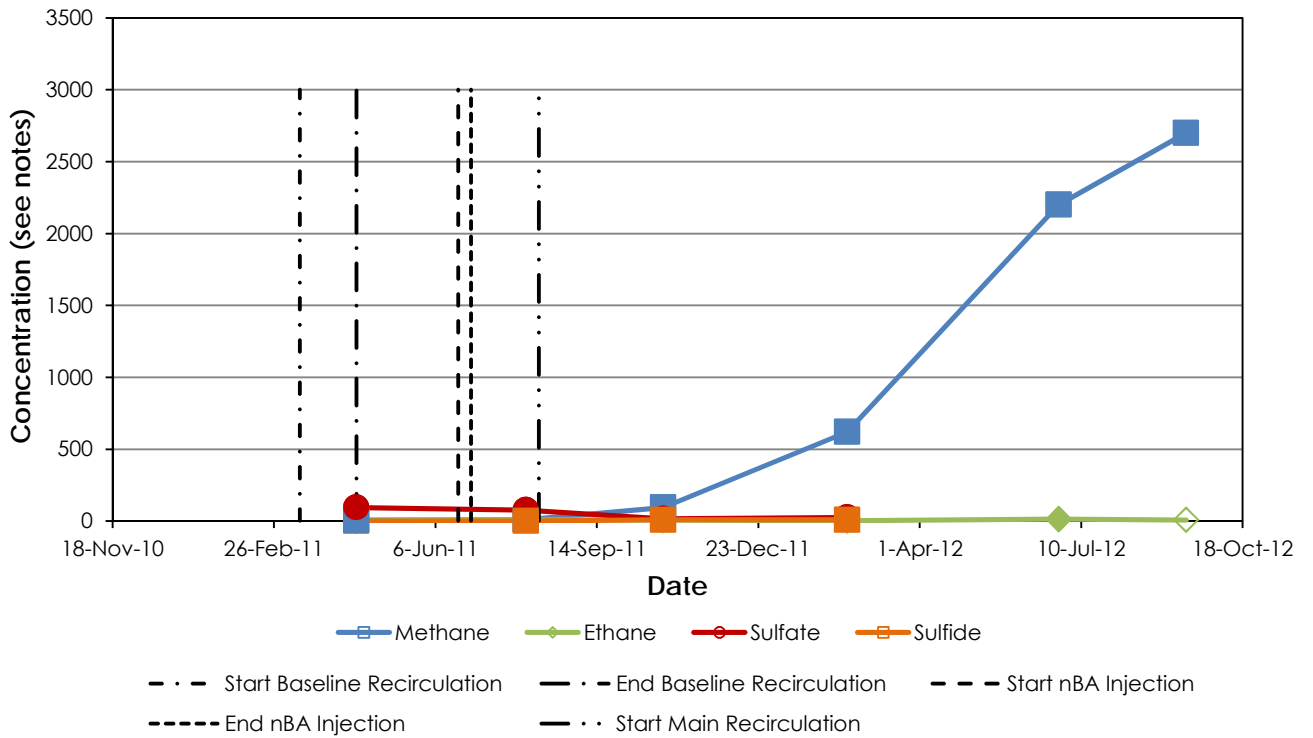
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001E - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-5a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001E - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



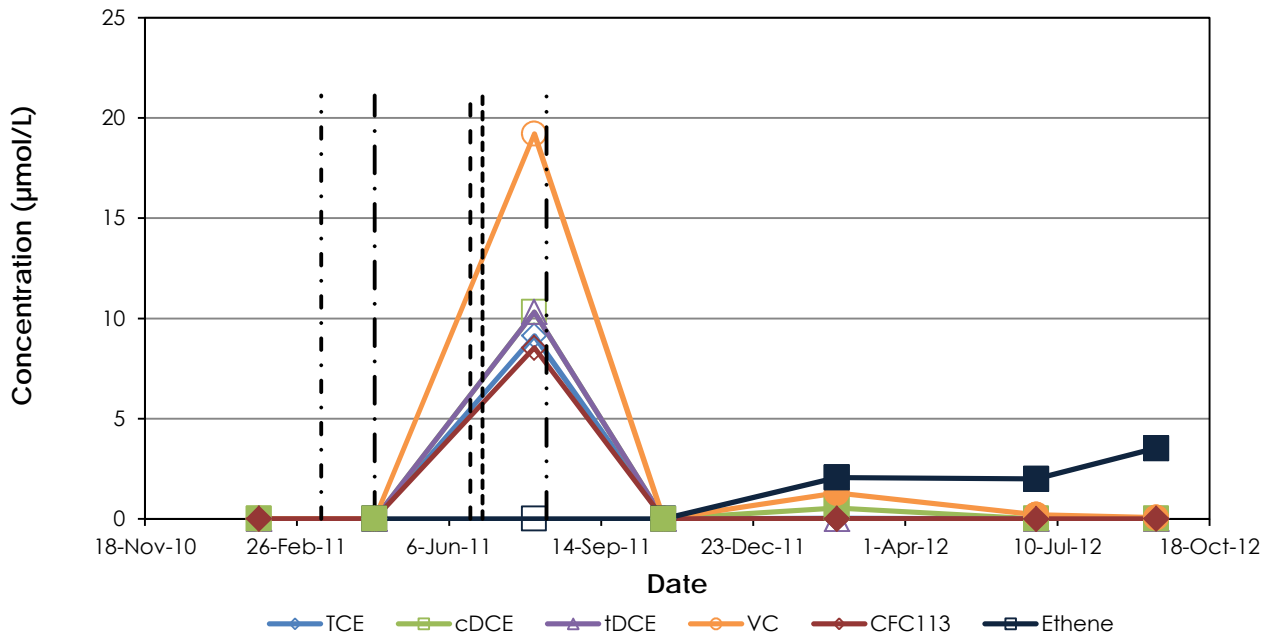
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E-2-5b

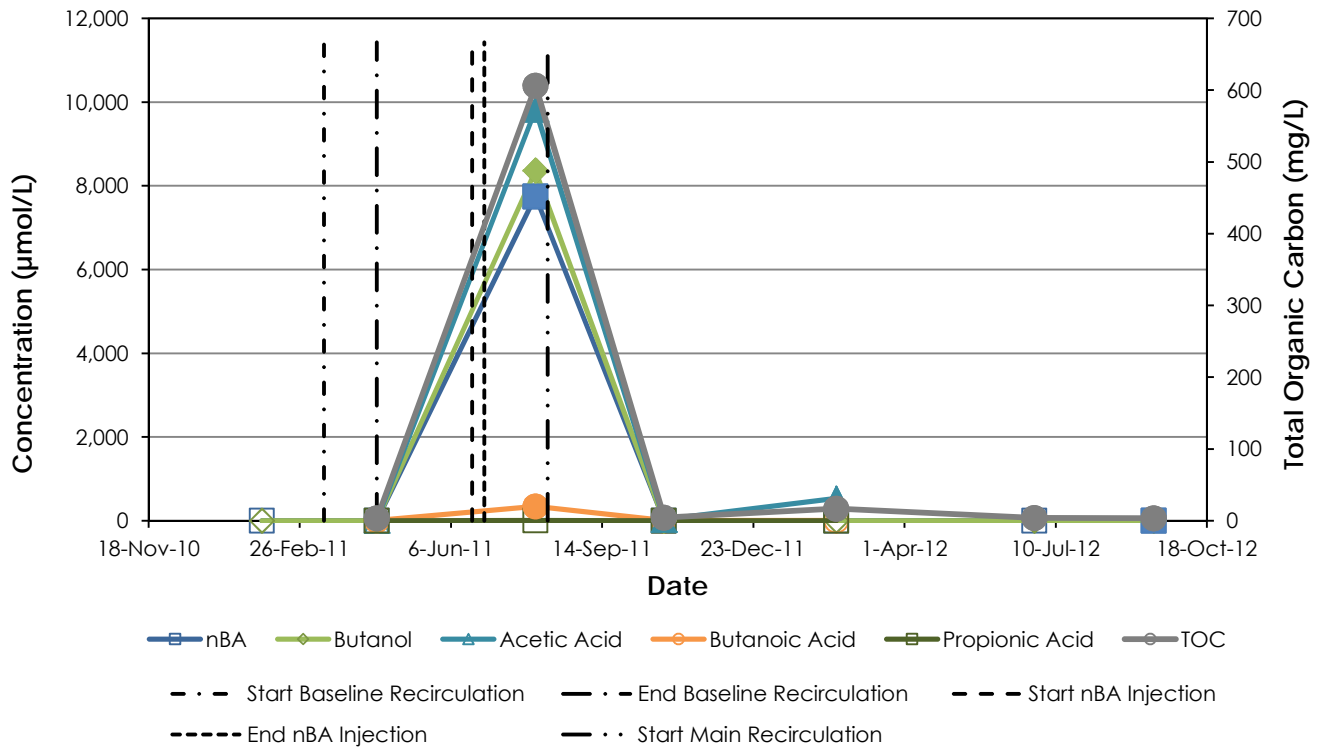
Guelph

May 2014

A) Volatile Organic Compounds




B) Donors and Volatile Fatty Acids

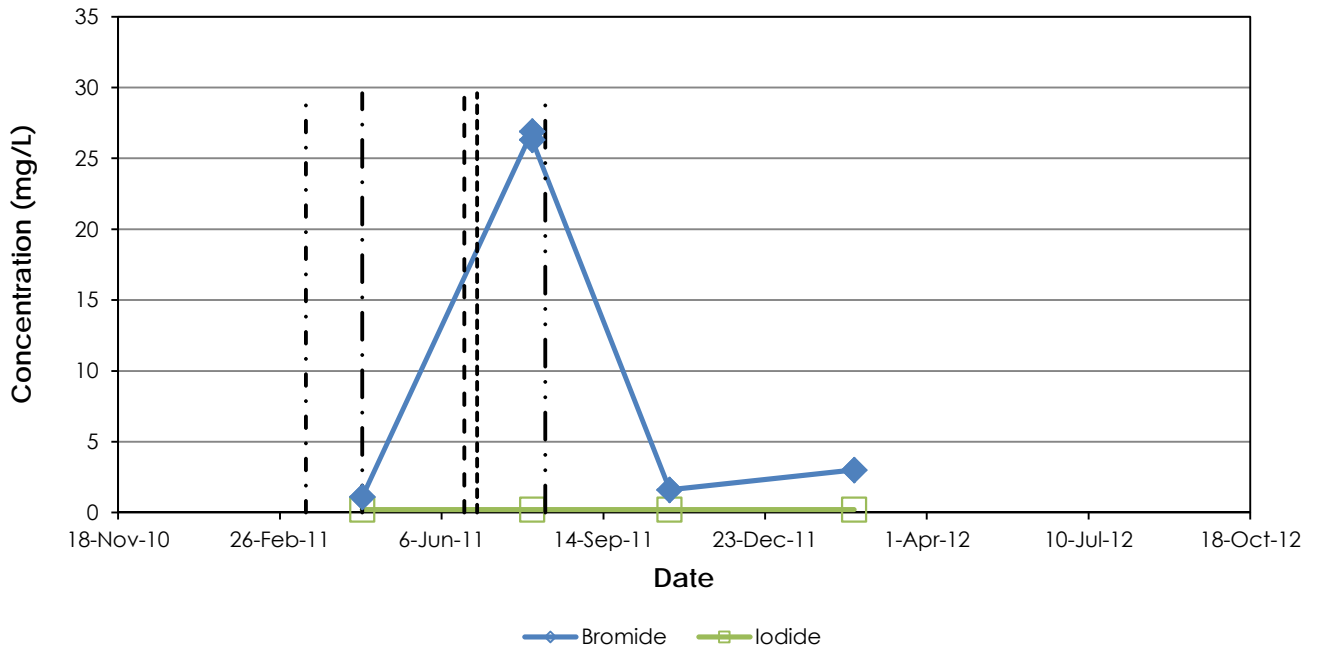


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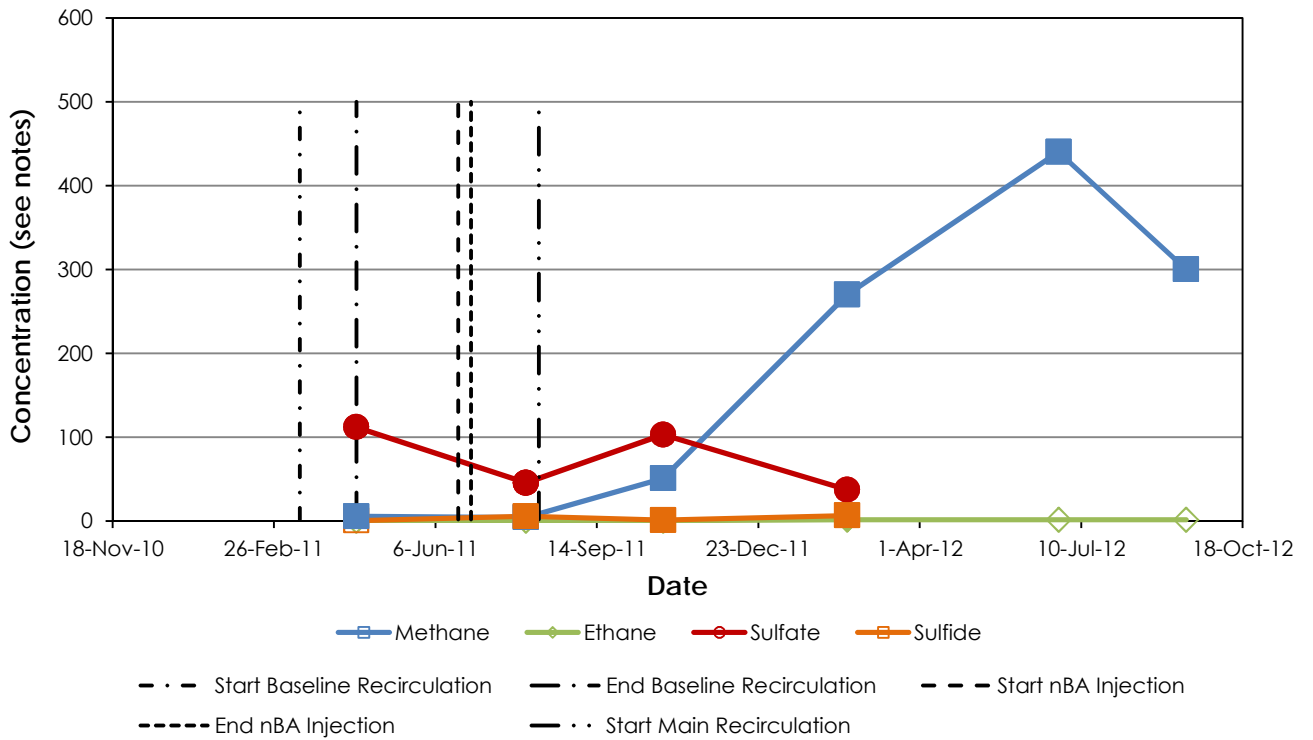
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001F - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
Figure E-2-6a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0001F - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



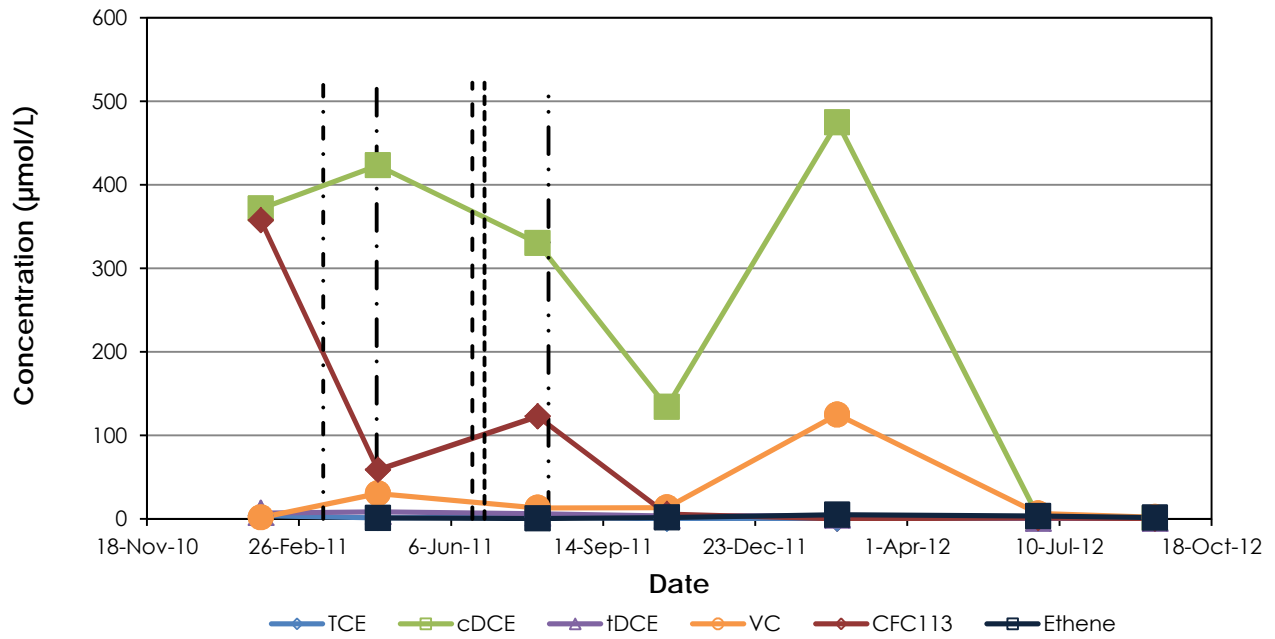
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E-2-6b

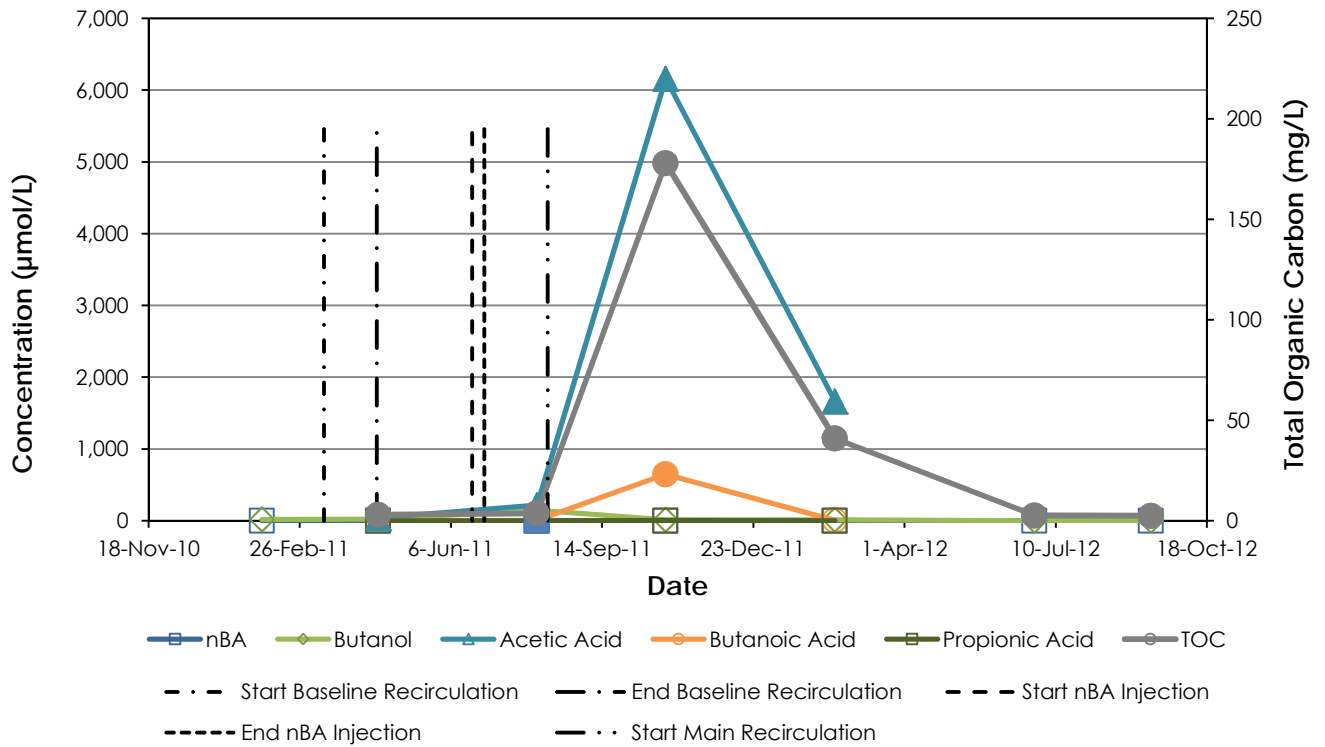
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

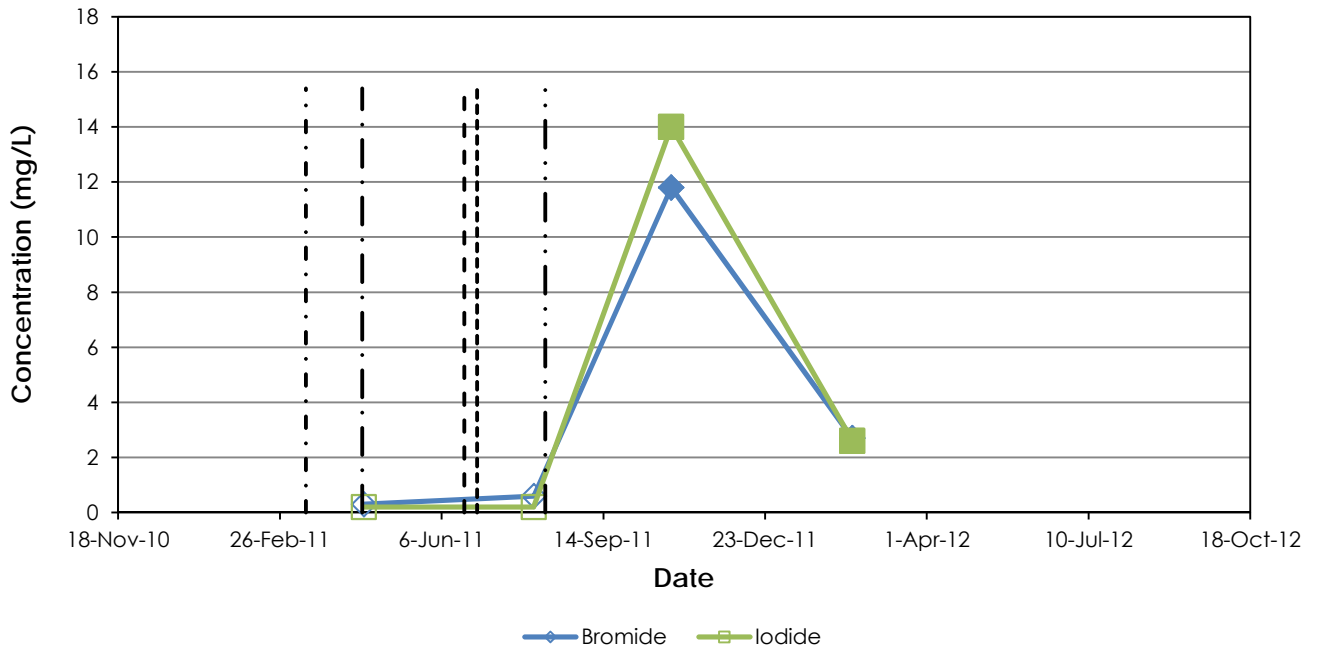


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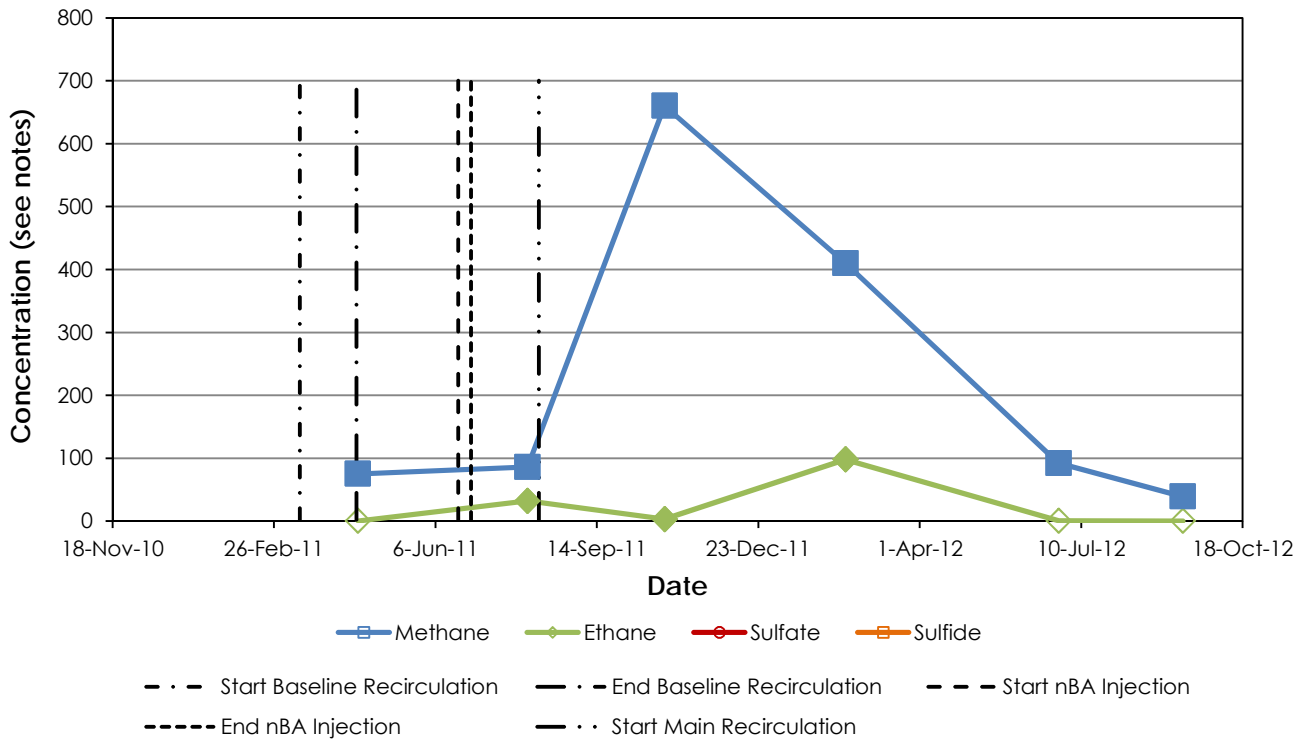
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002A - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-7a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002A - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



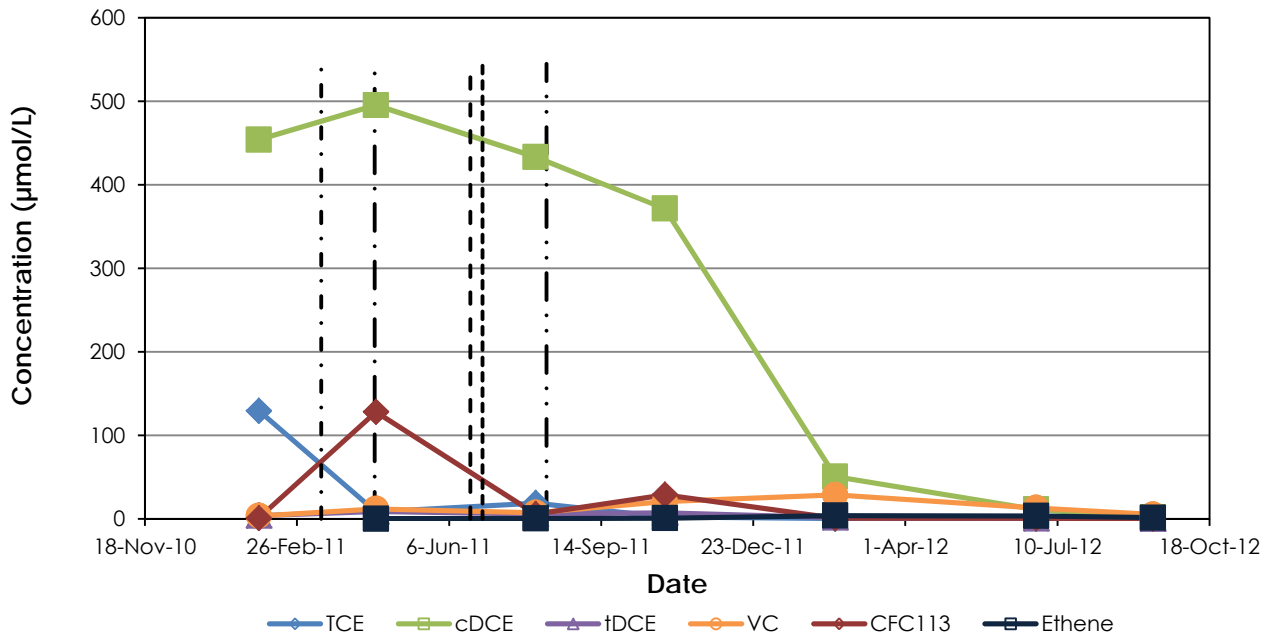
Figure

E-2-7b

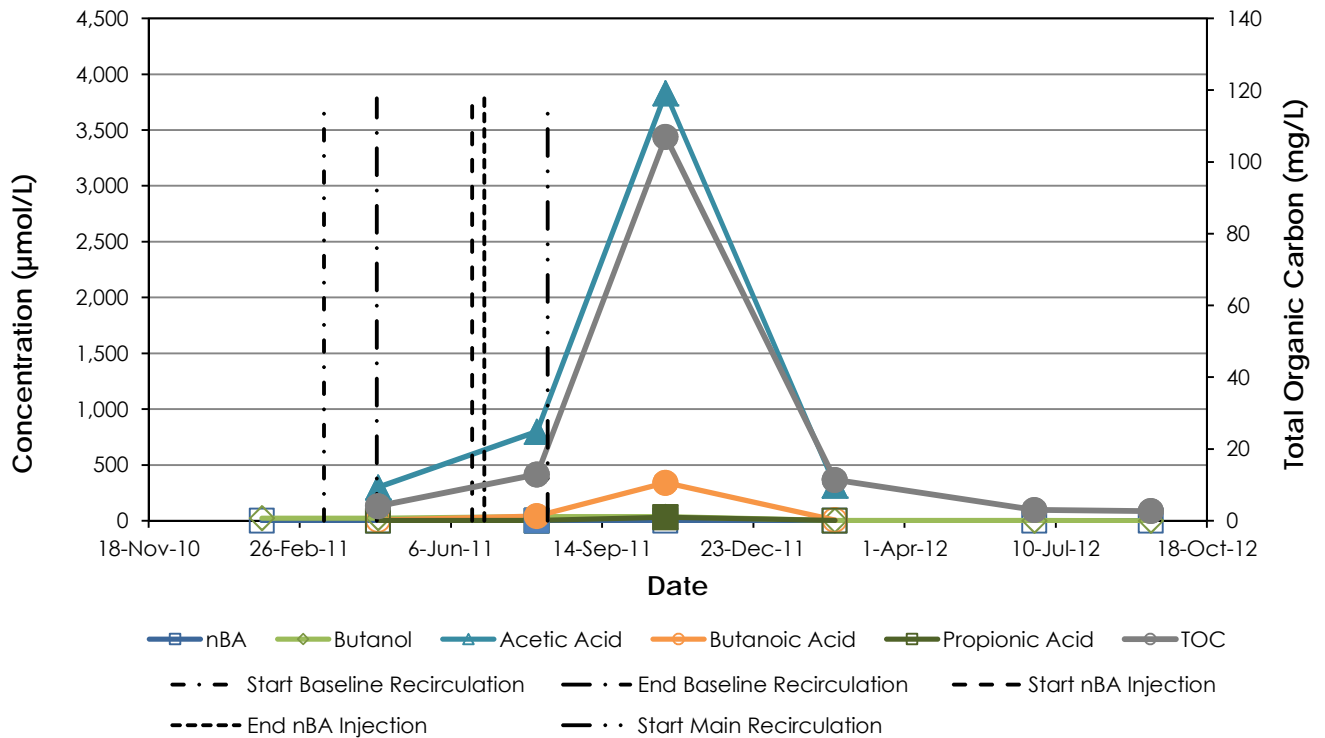
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

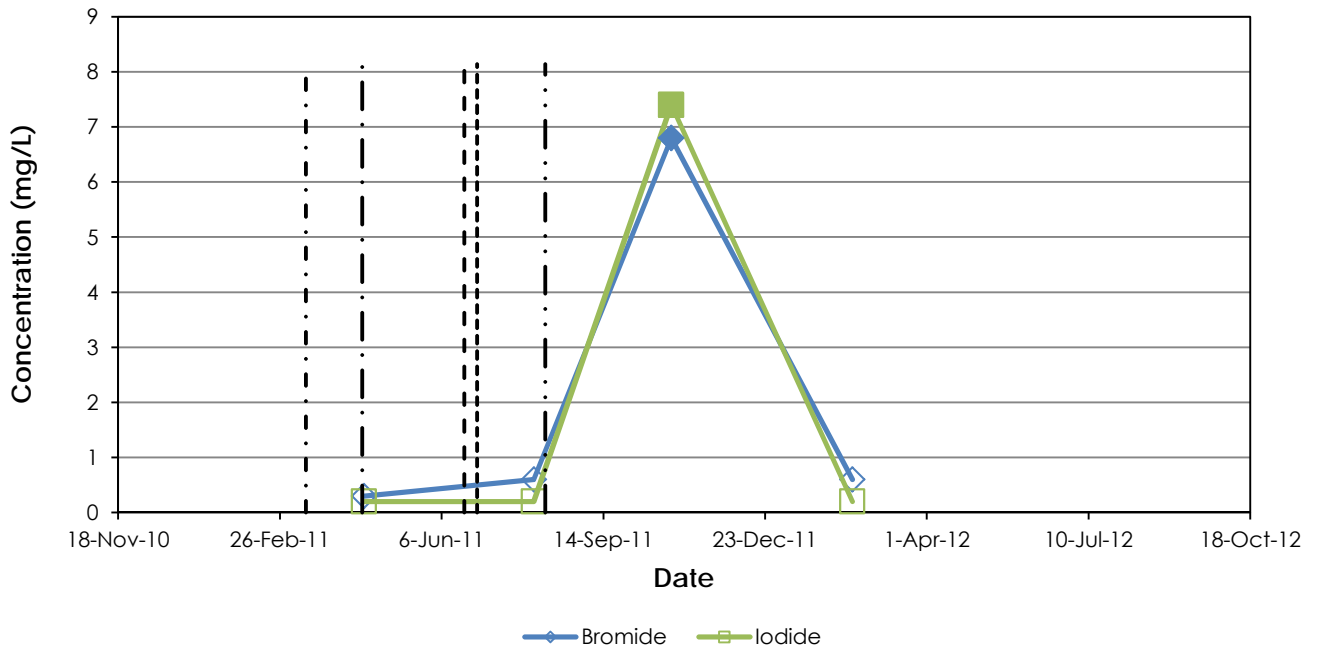


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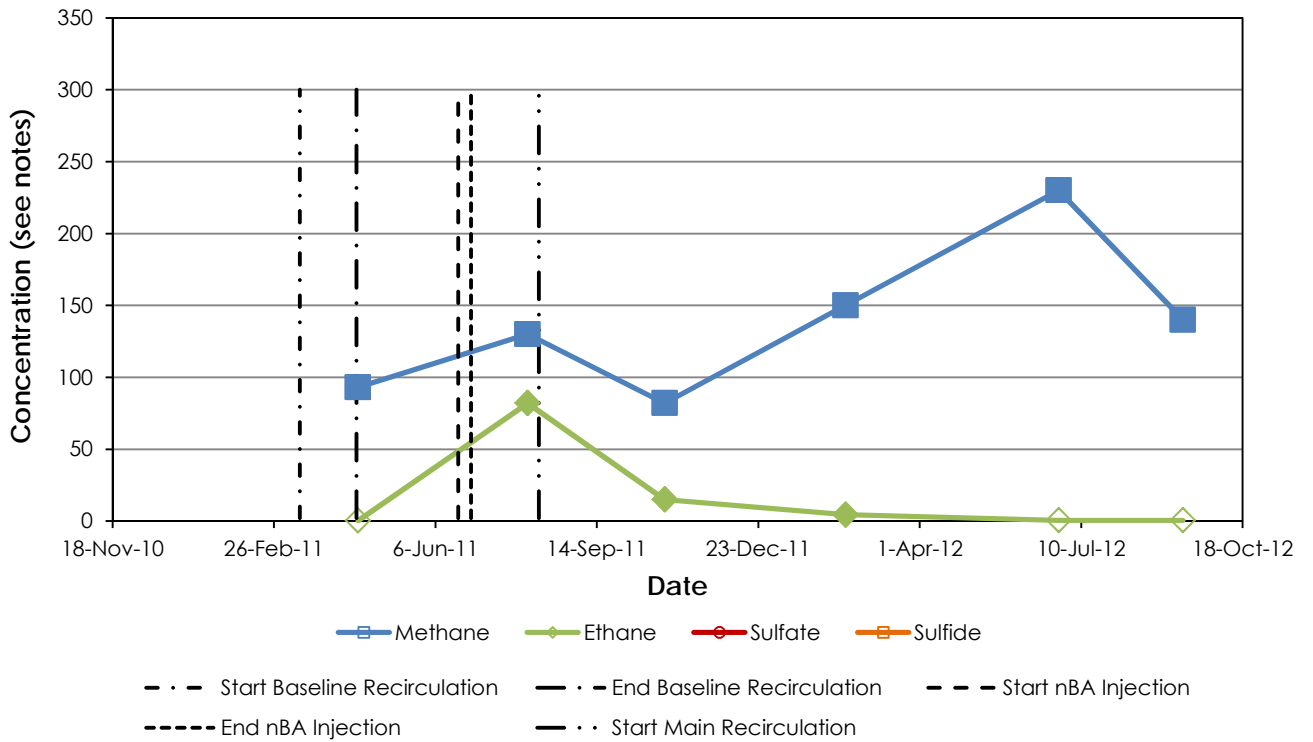
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002B - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-8a	

C) Tracers



D) Geochemical Parameters



Notes:

mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002B - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



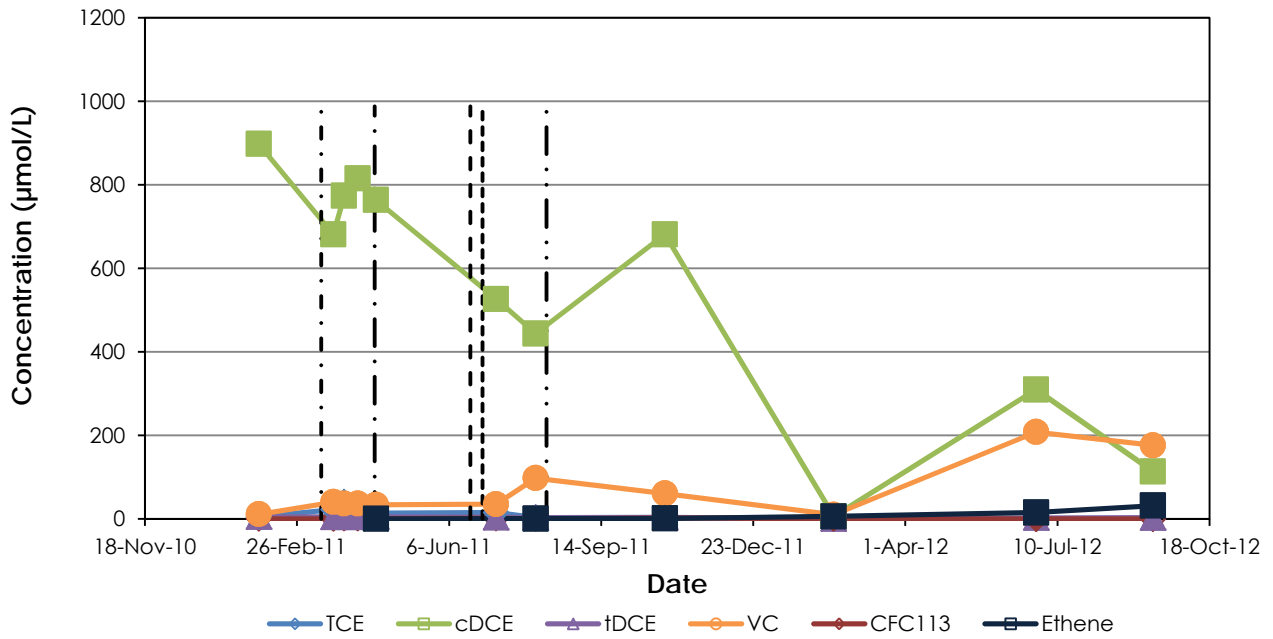
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E-2-8b

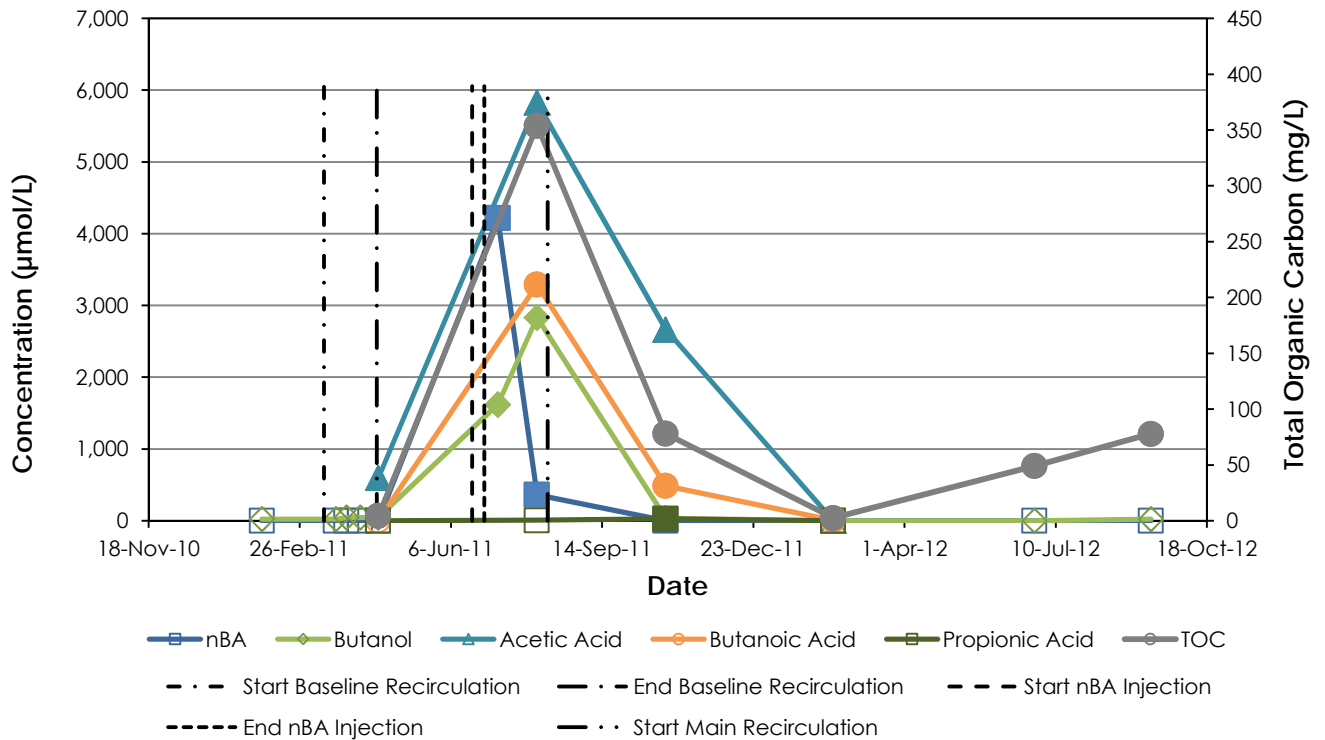
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002C - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



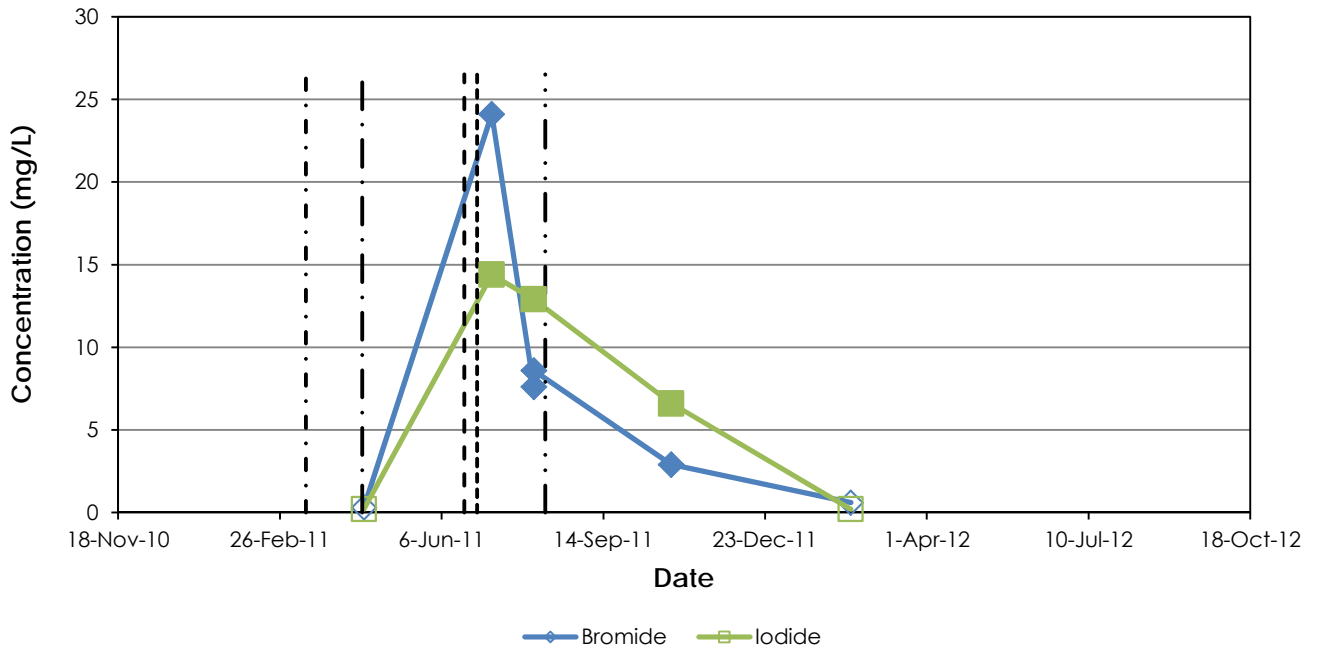
Figure

E-2-9a

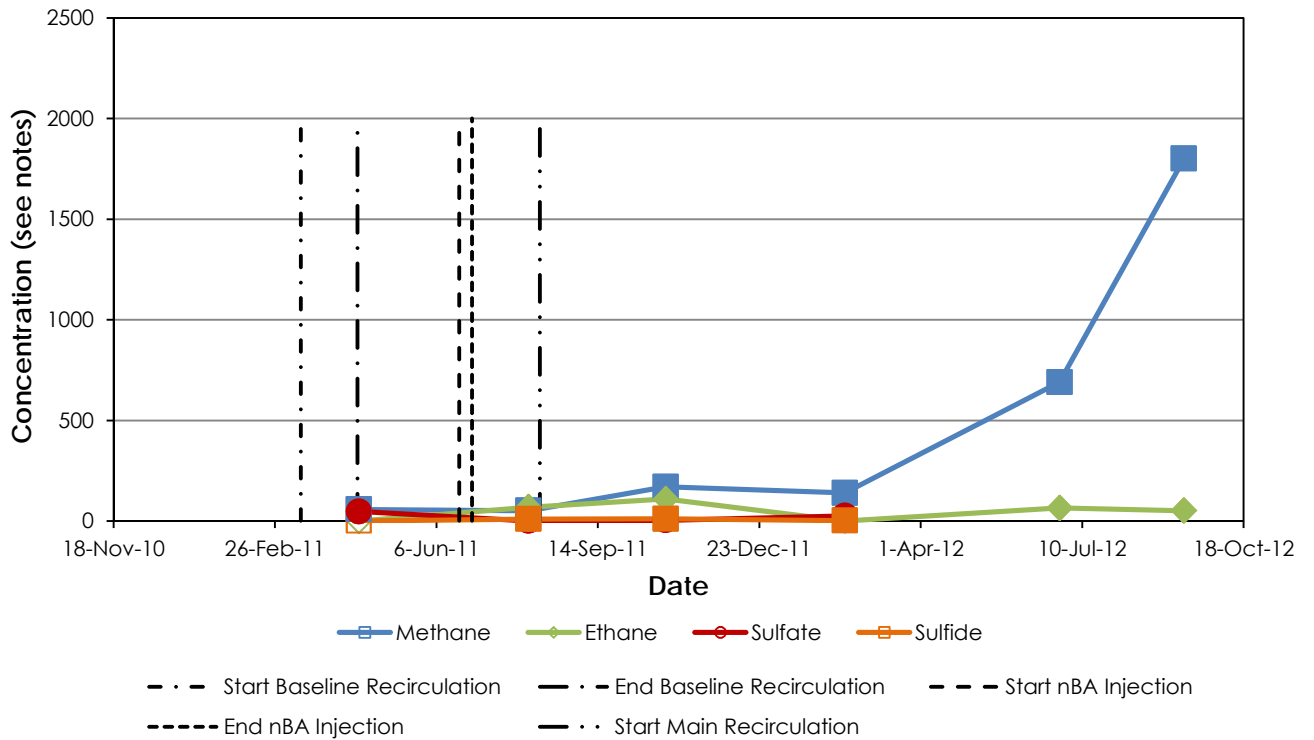
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002C - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



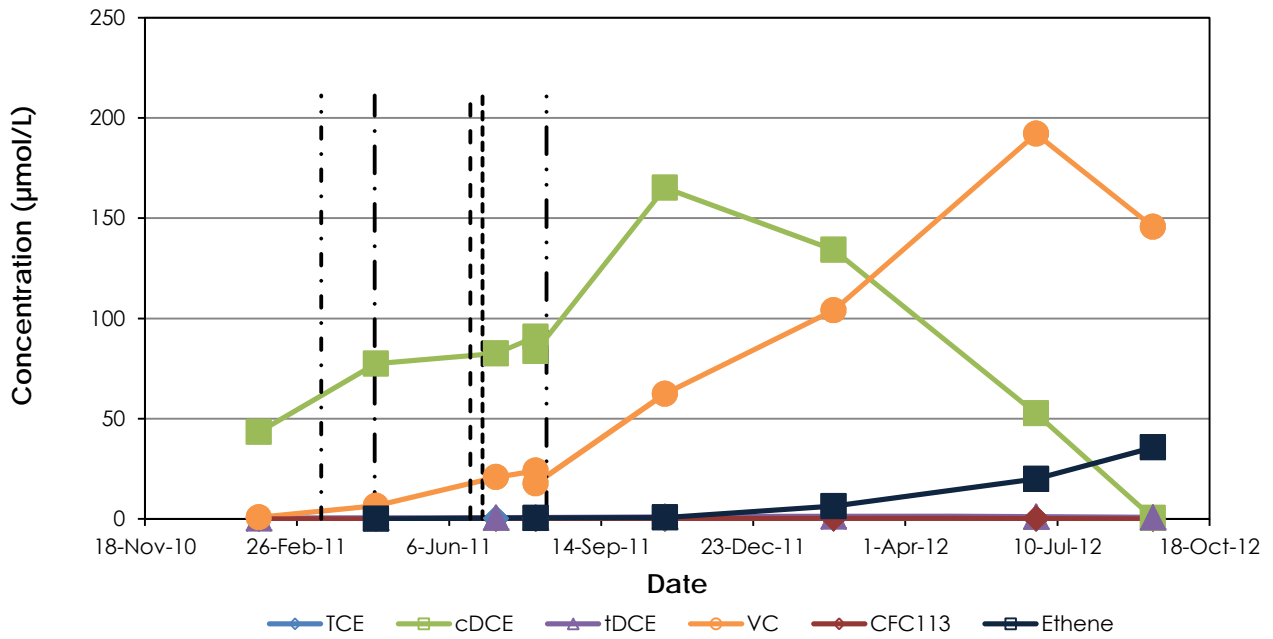
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E-2-9b

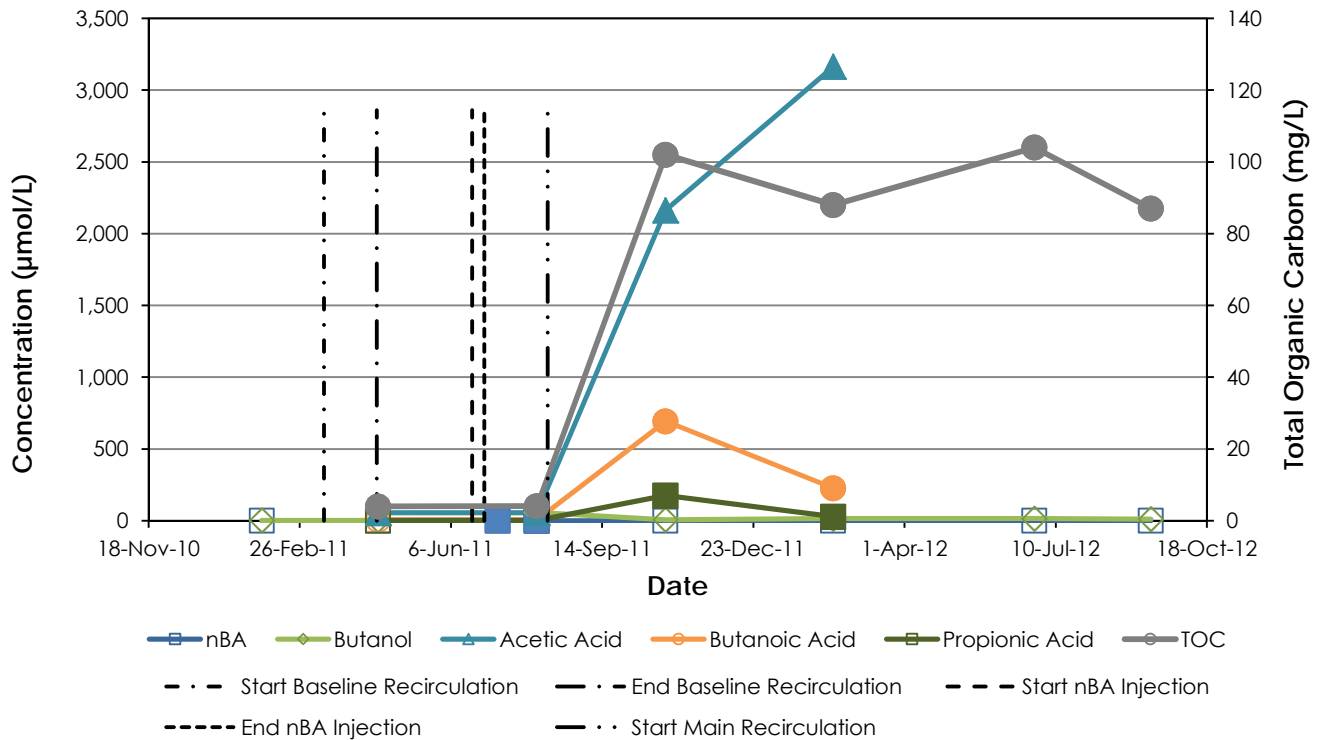
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002D - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



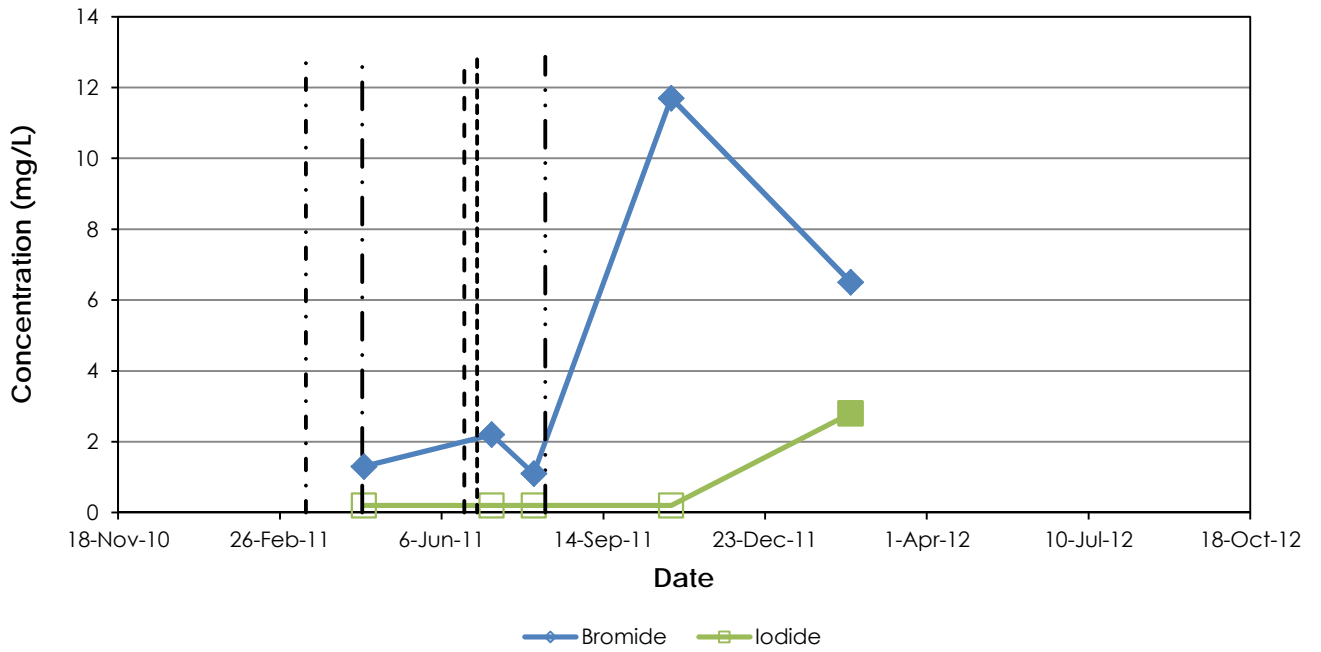
Figure

E-2-10a

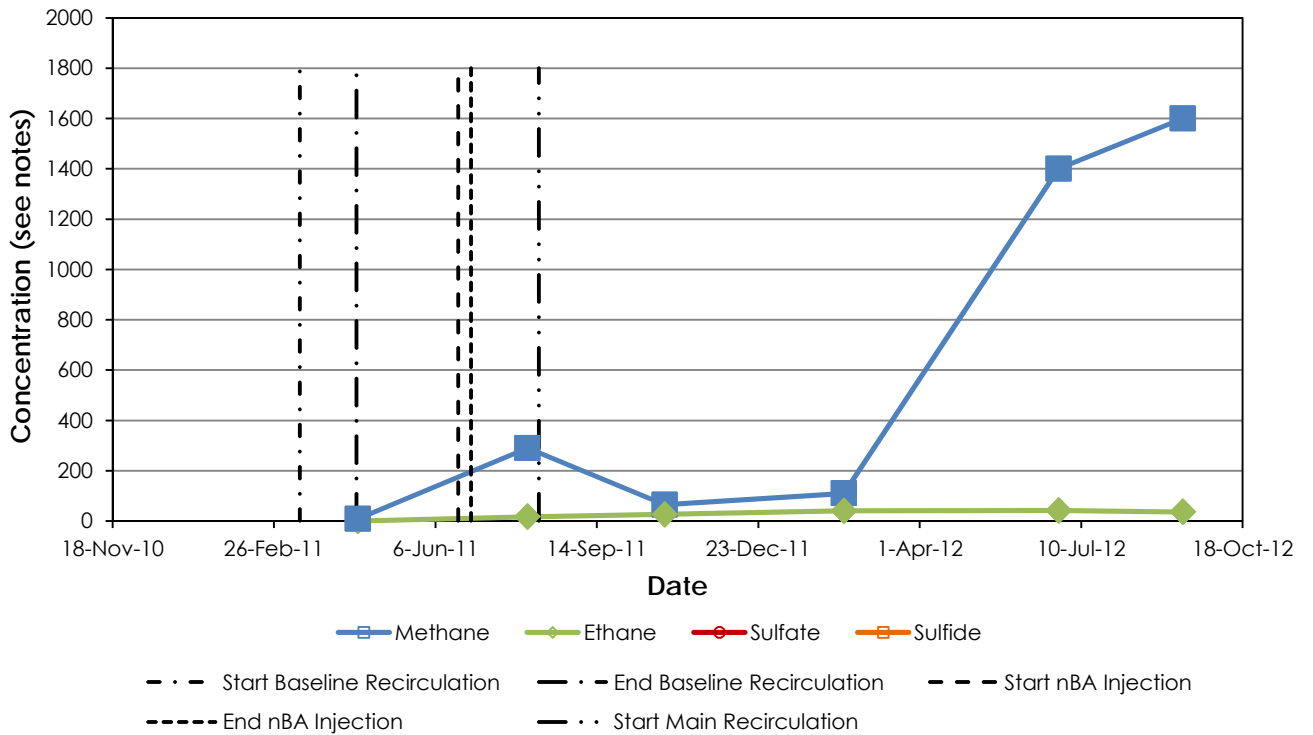
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002D - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



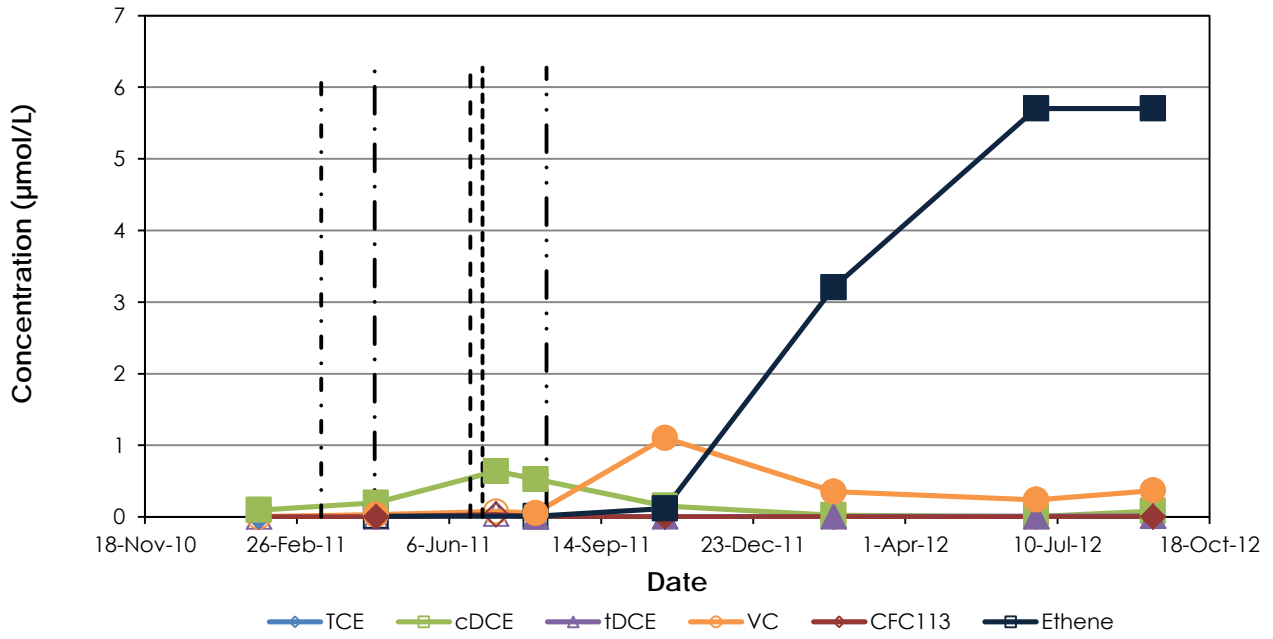
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E-2-10b

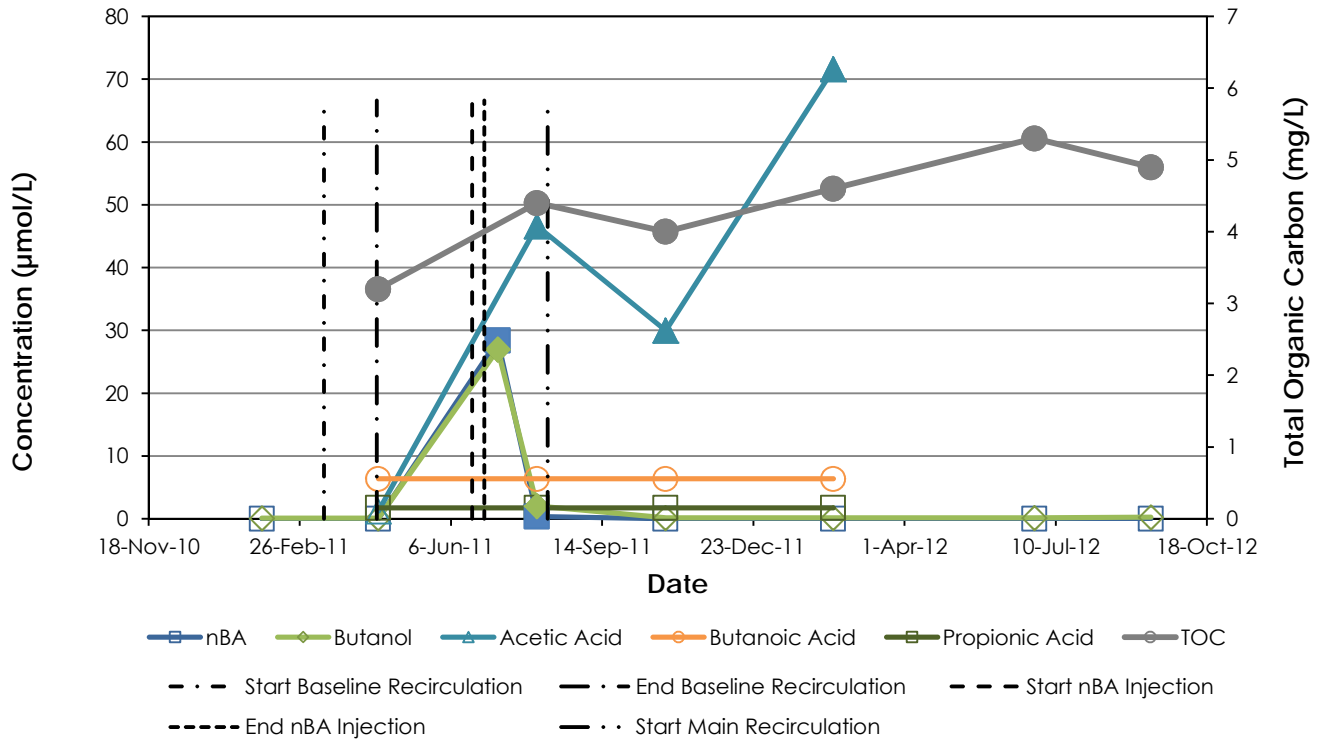
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002E - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



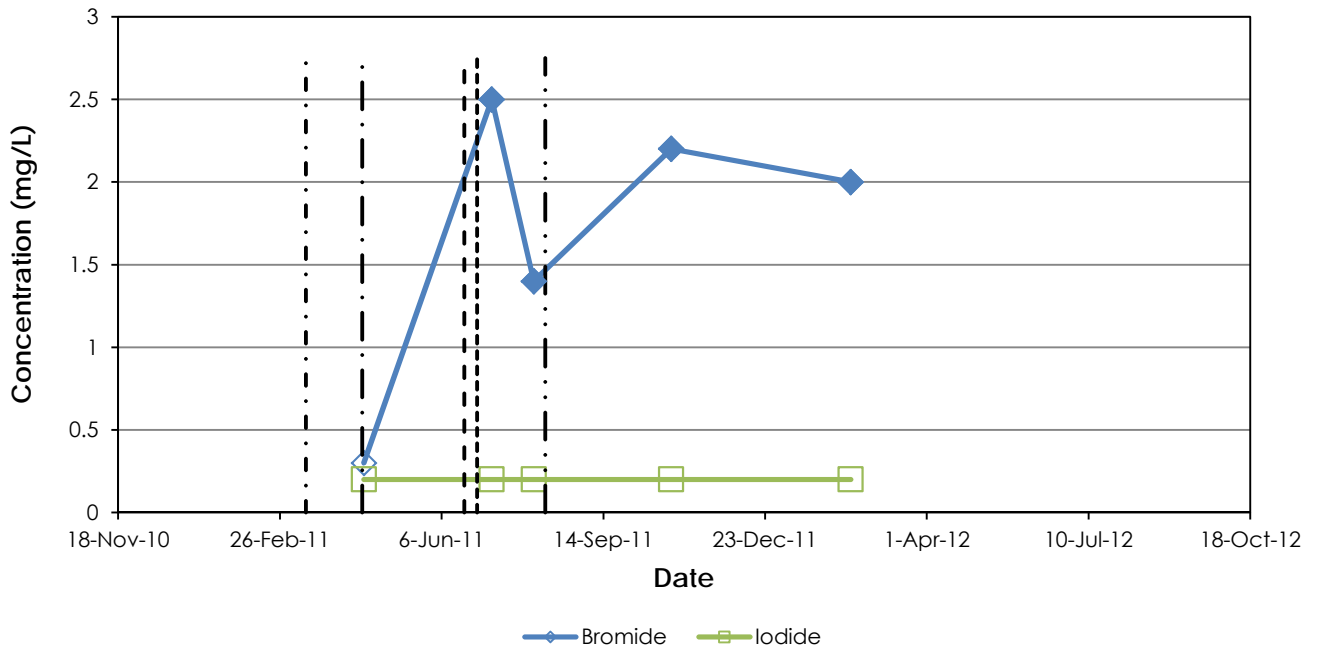
Figure

E-2-11a

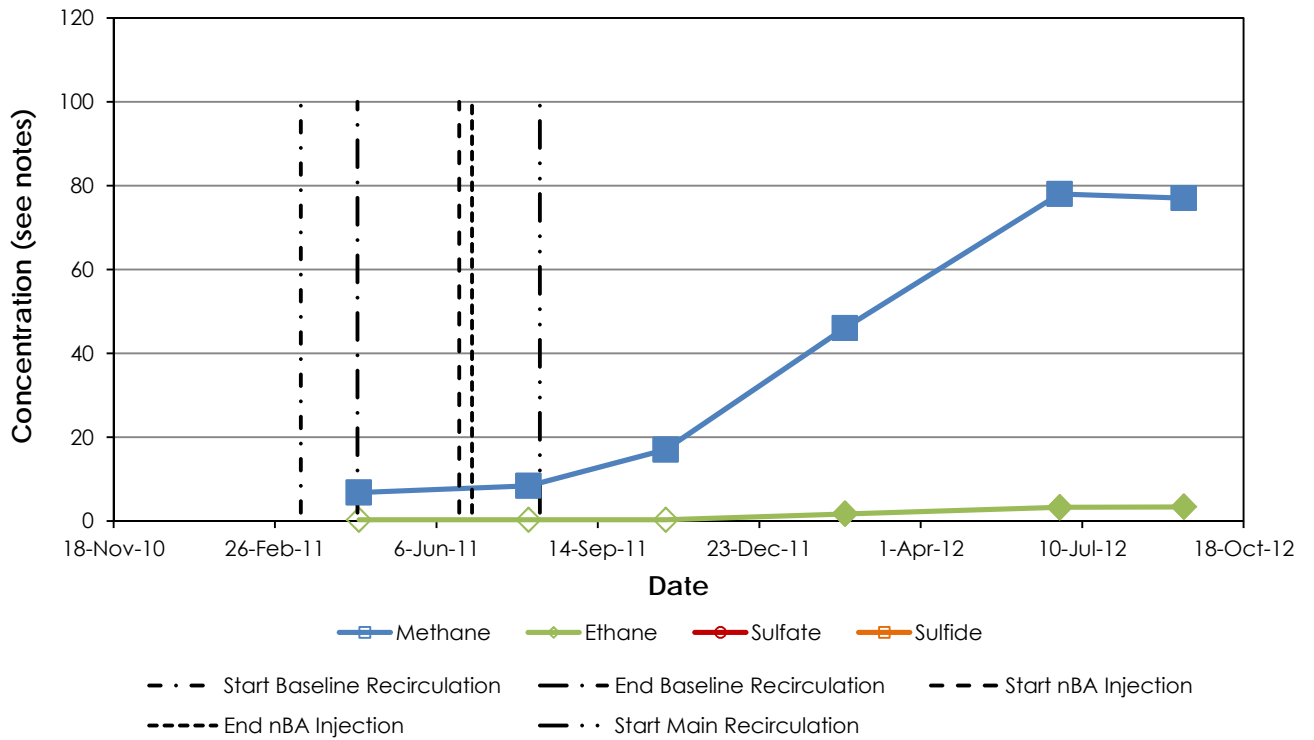
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002E - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



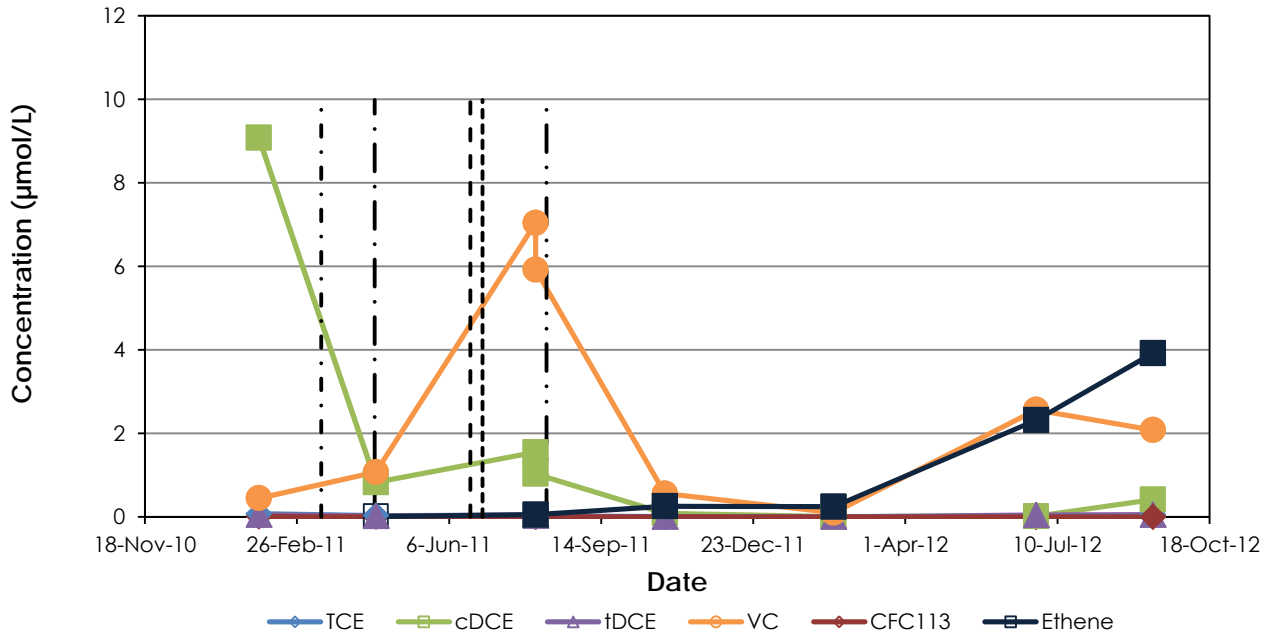
Figure

E-2-11b

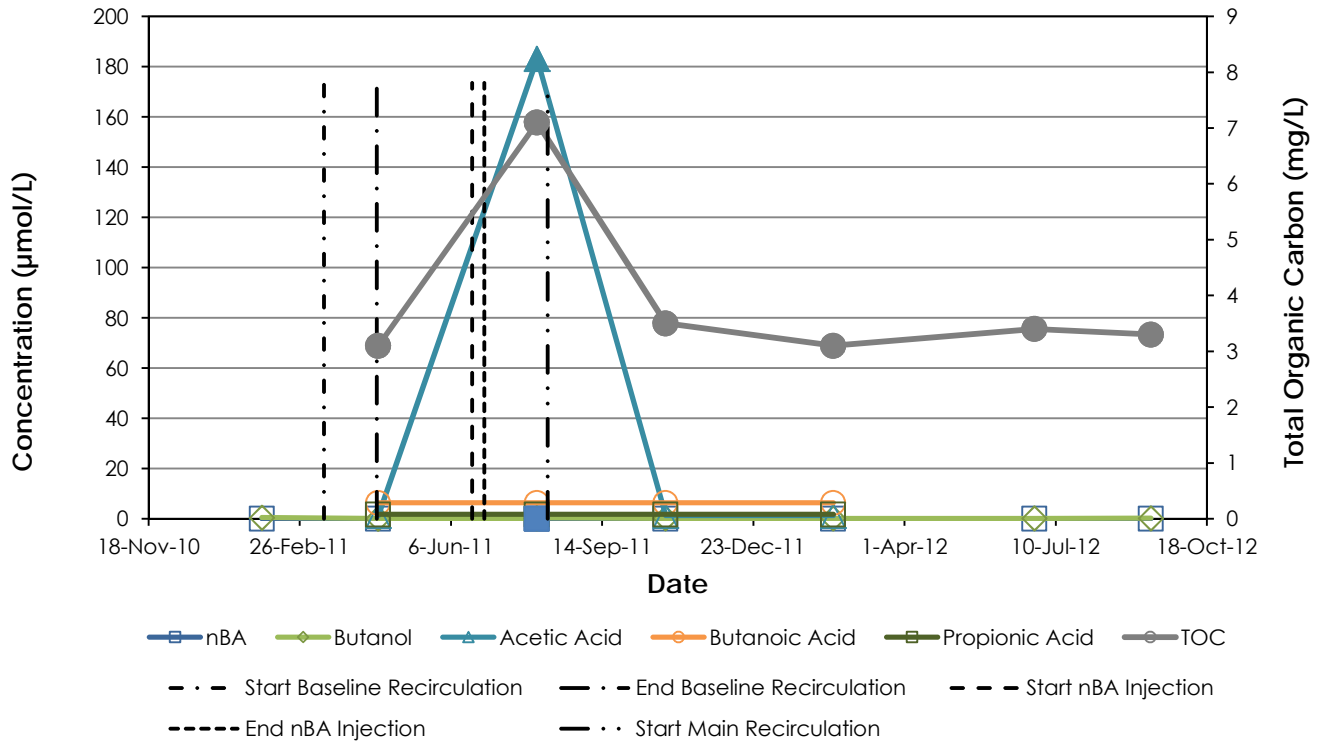
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002F - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



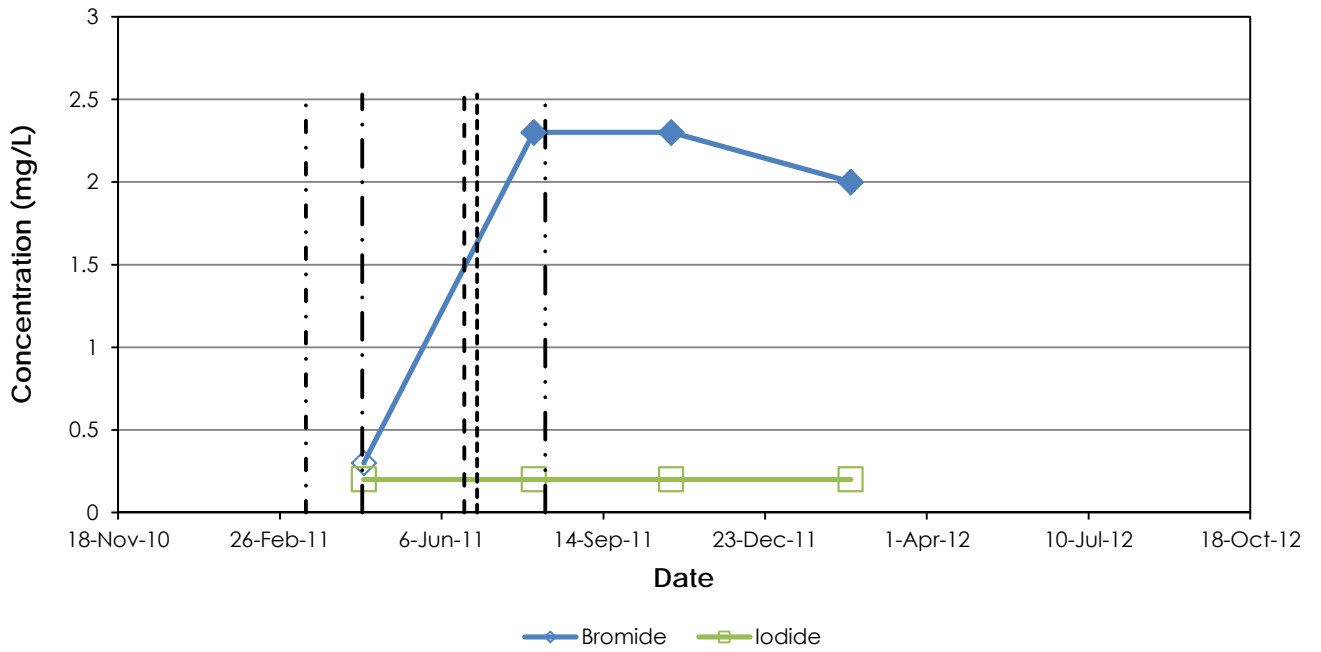
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E-2-12a

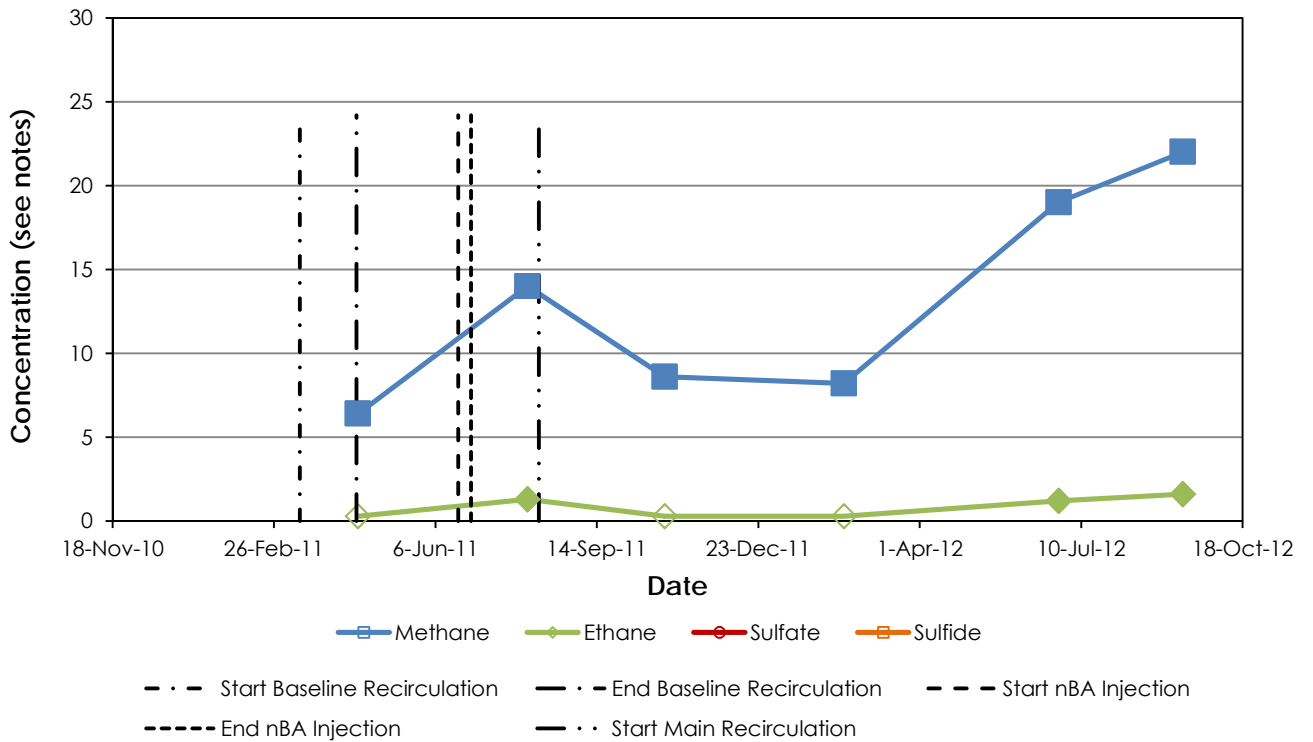
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:

mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0002F - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



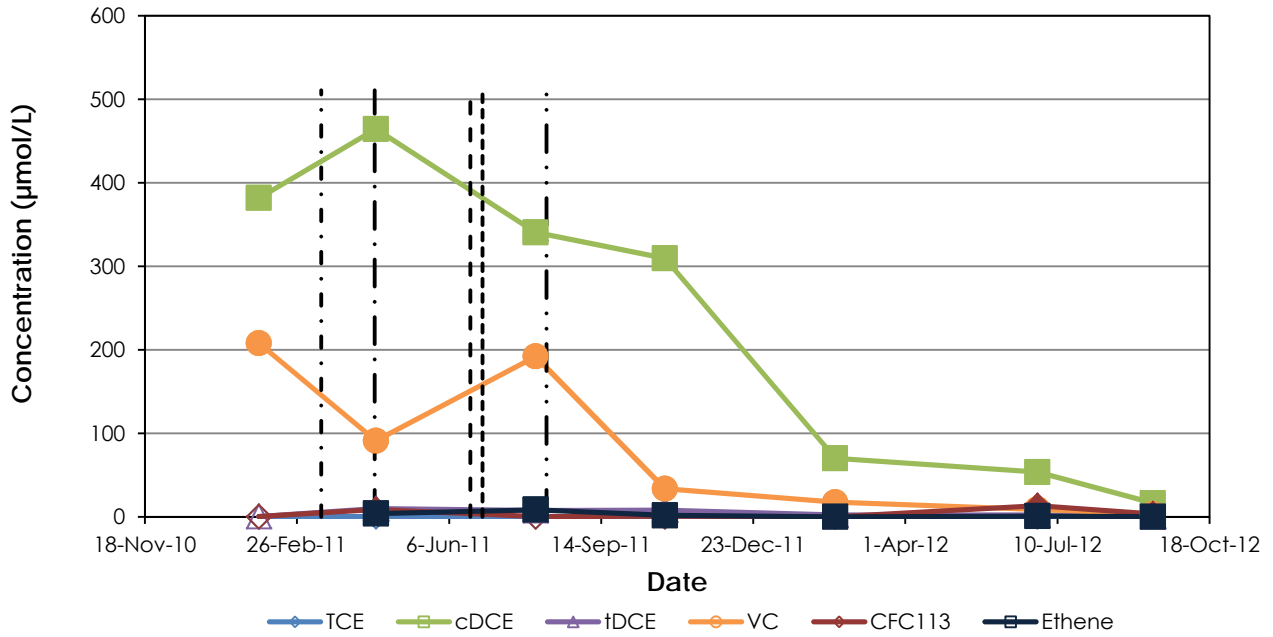
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E-2-12b

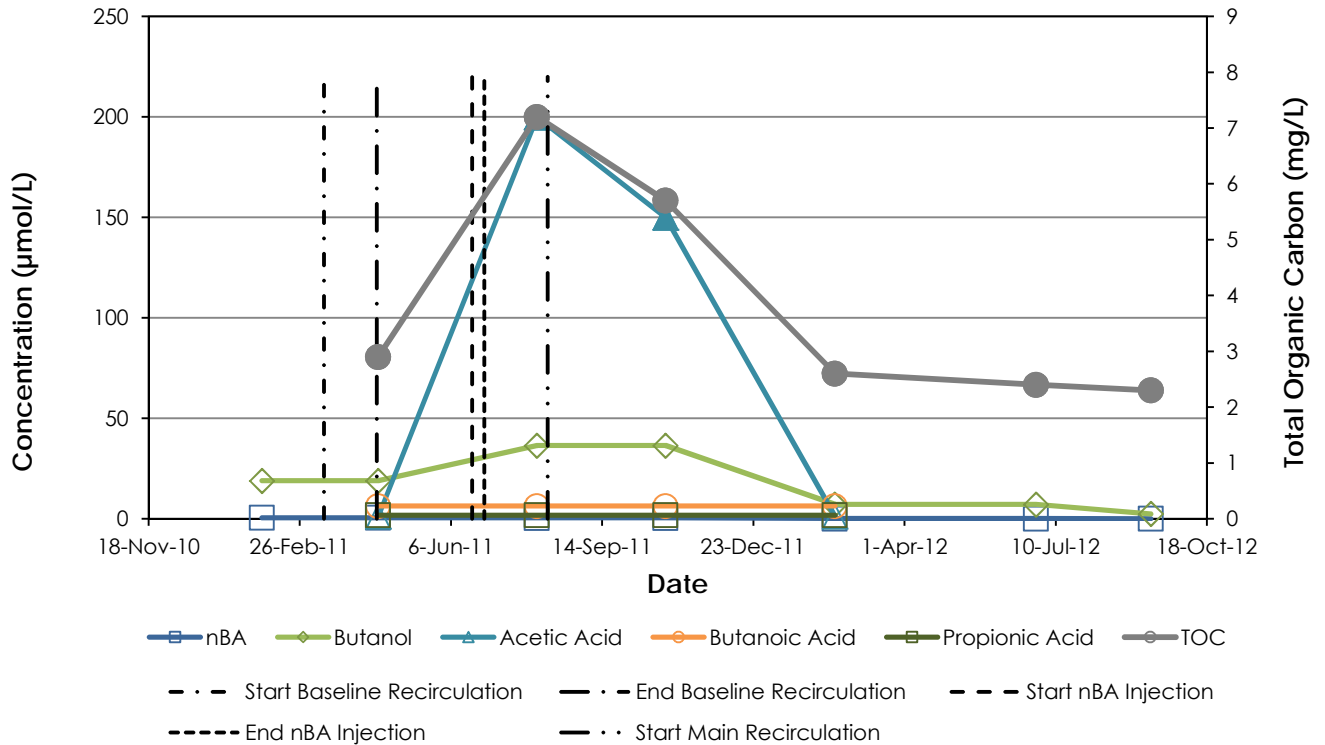
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003A - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



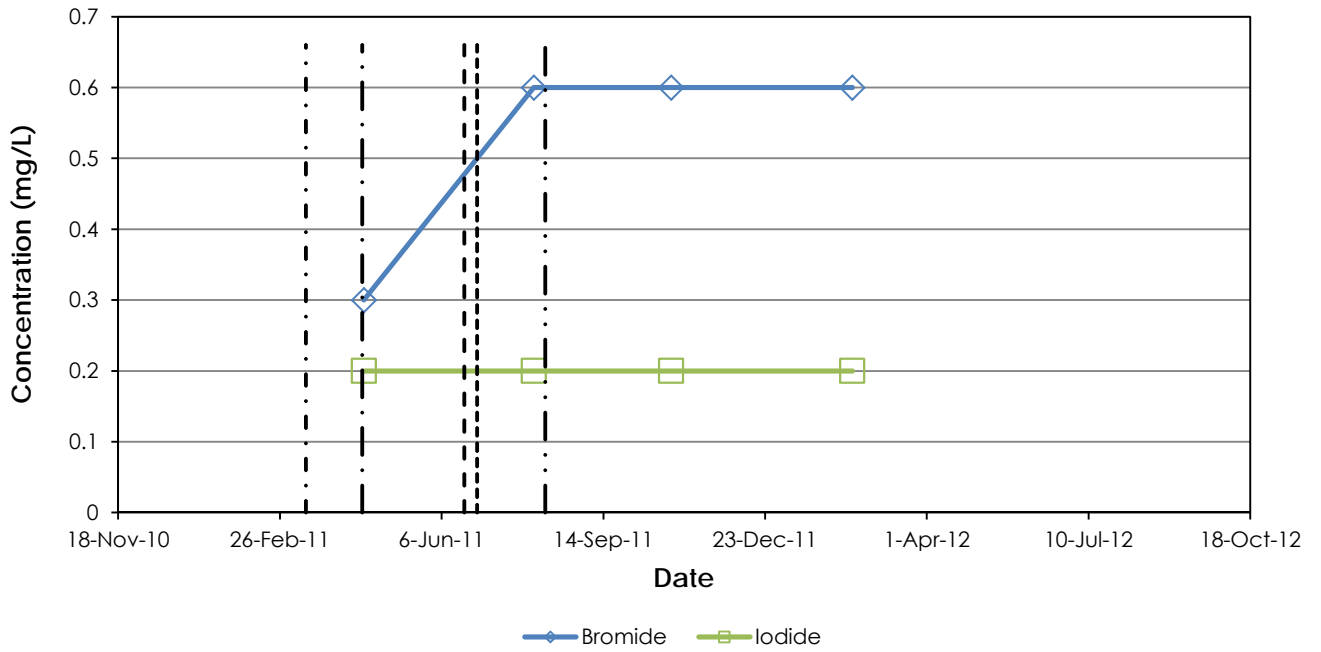
Figure

E-2-13a

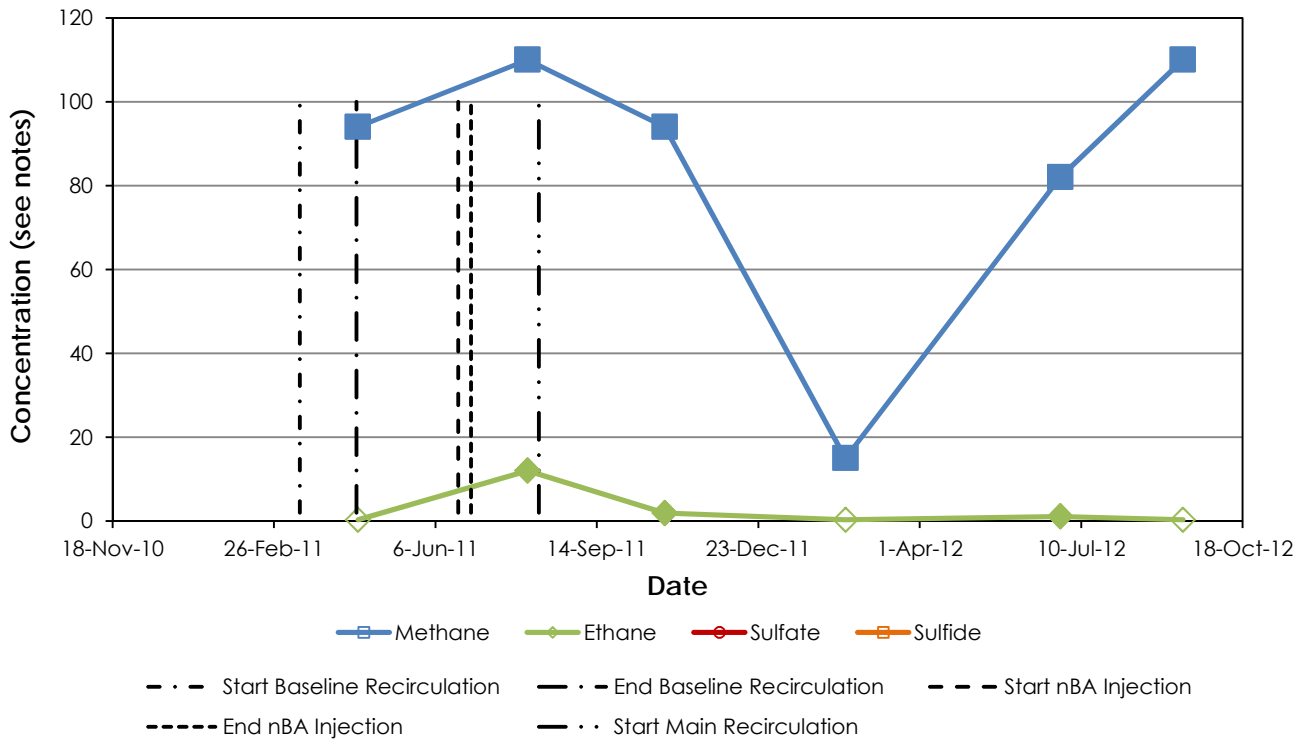
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003A - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



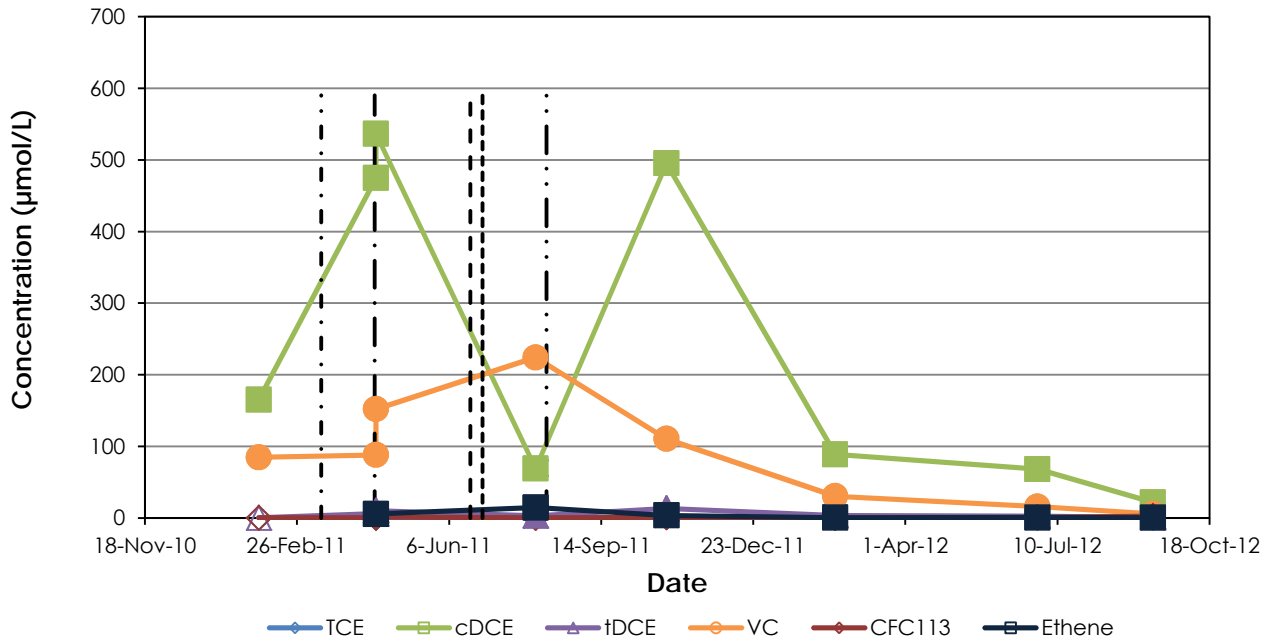
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E-2-13b

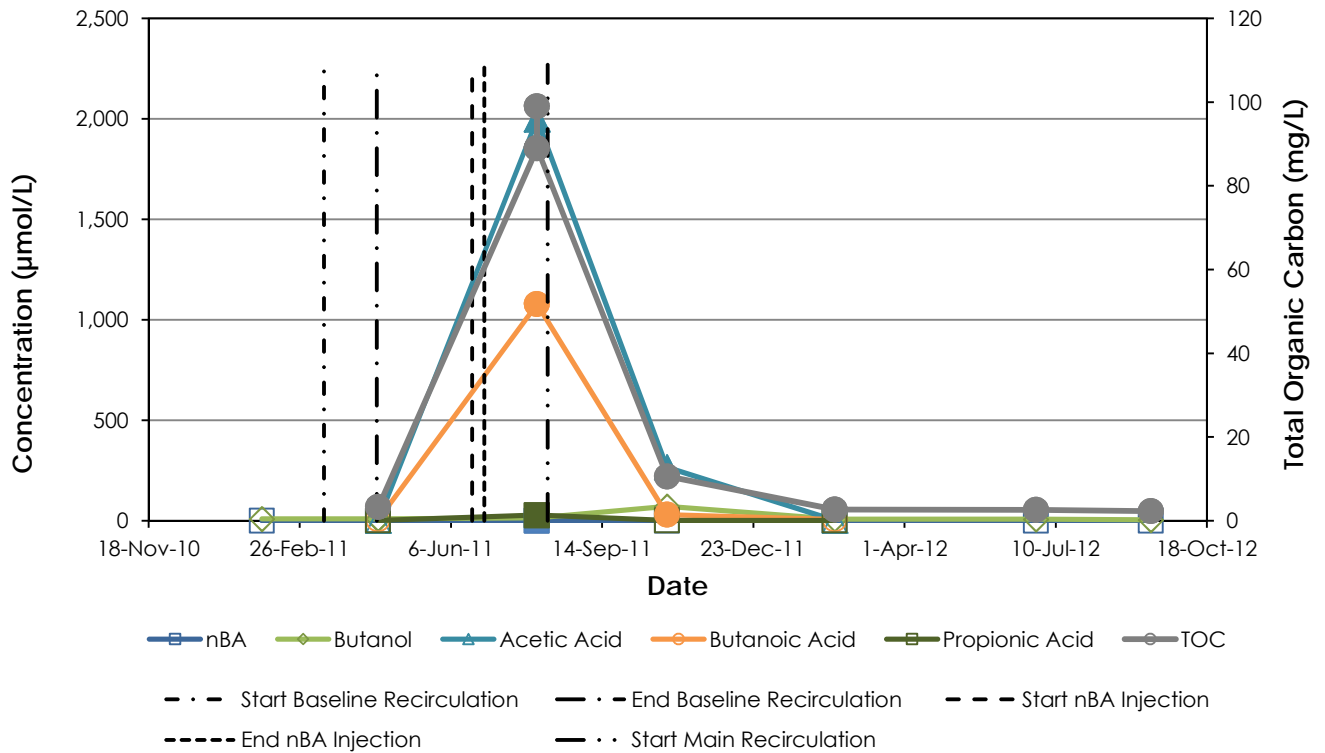
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

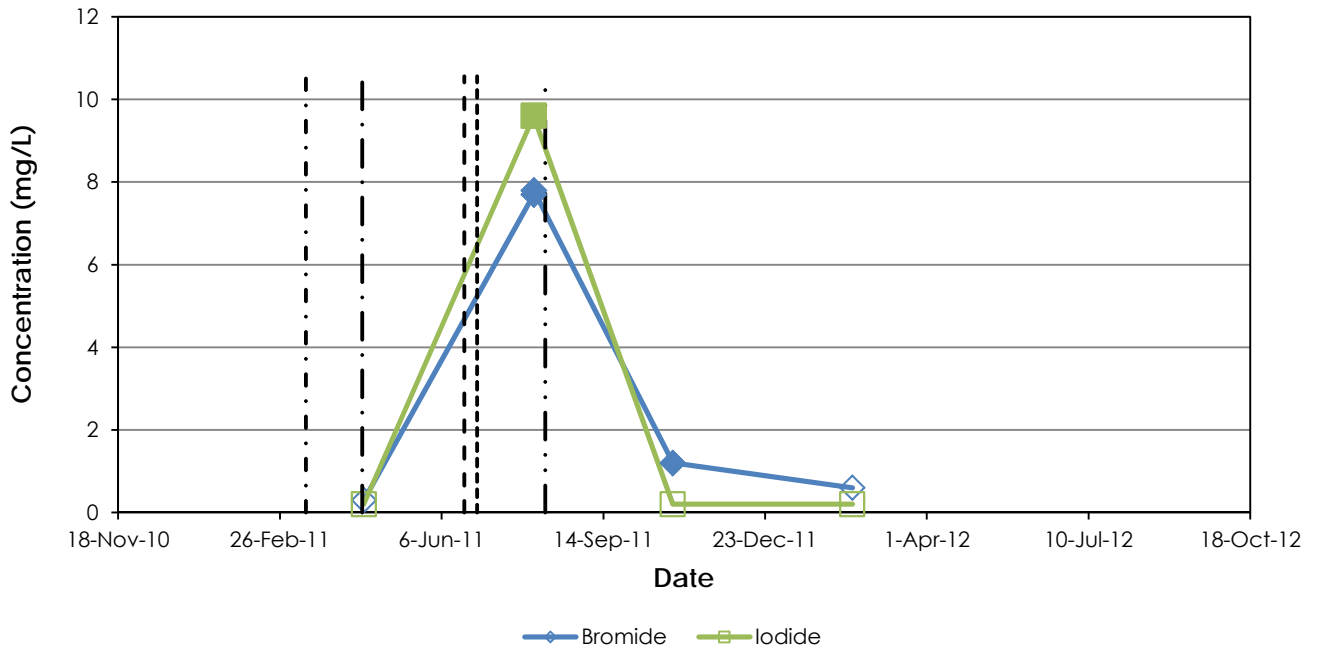


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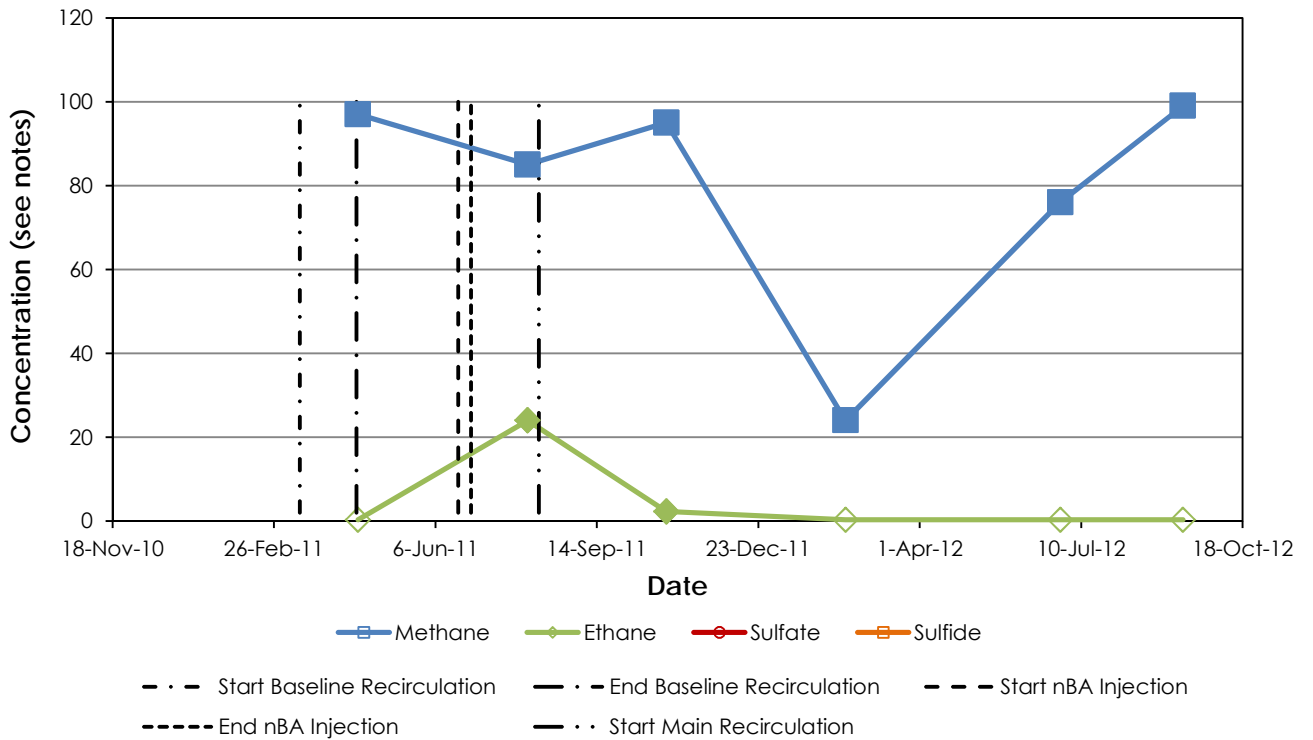
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003B - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-14a	

C) Tracers



D) Geochemical Parameters



Notes:

mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003B - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



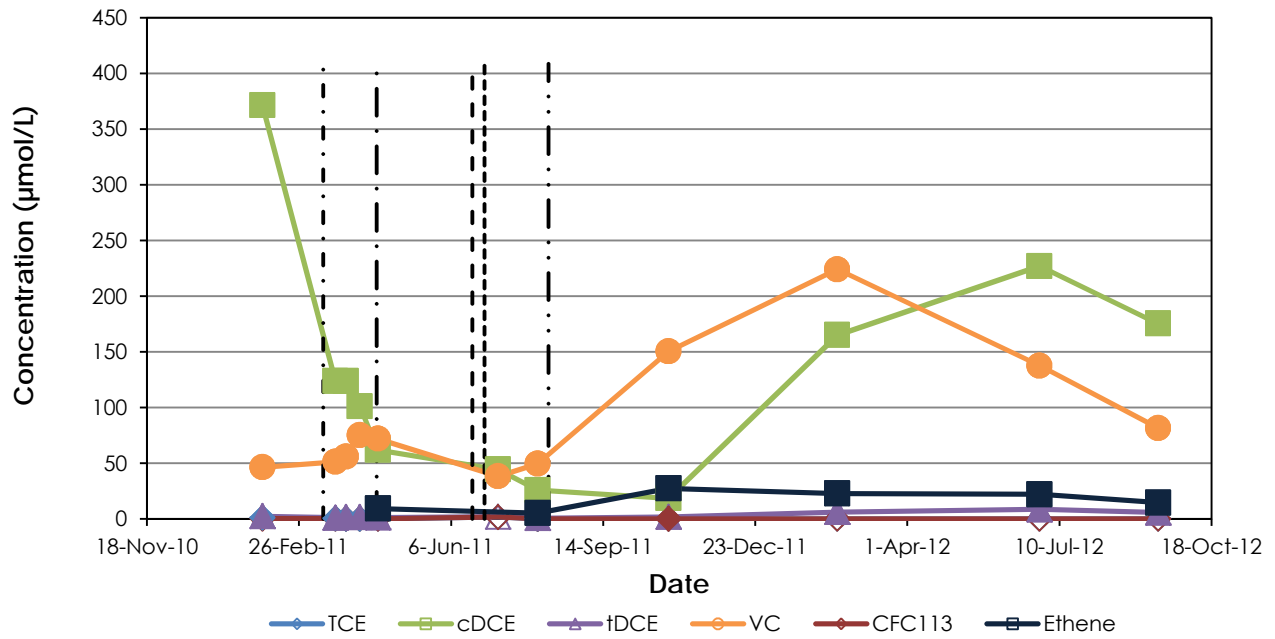
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E-2-14b

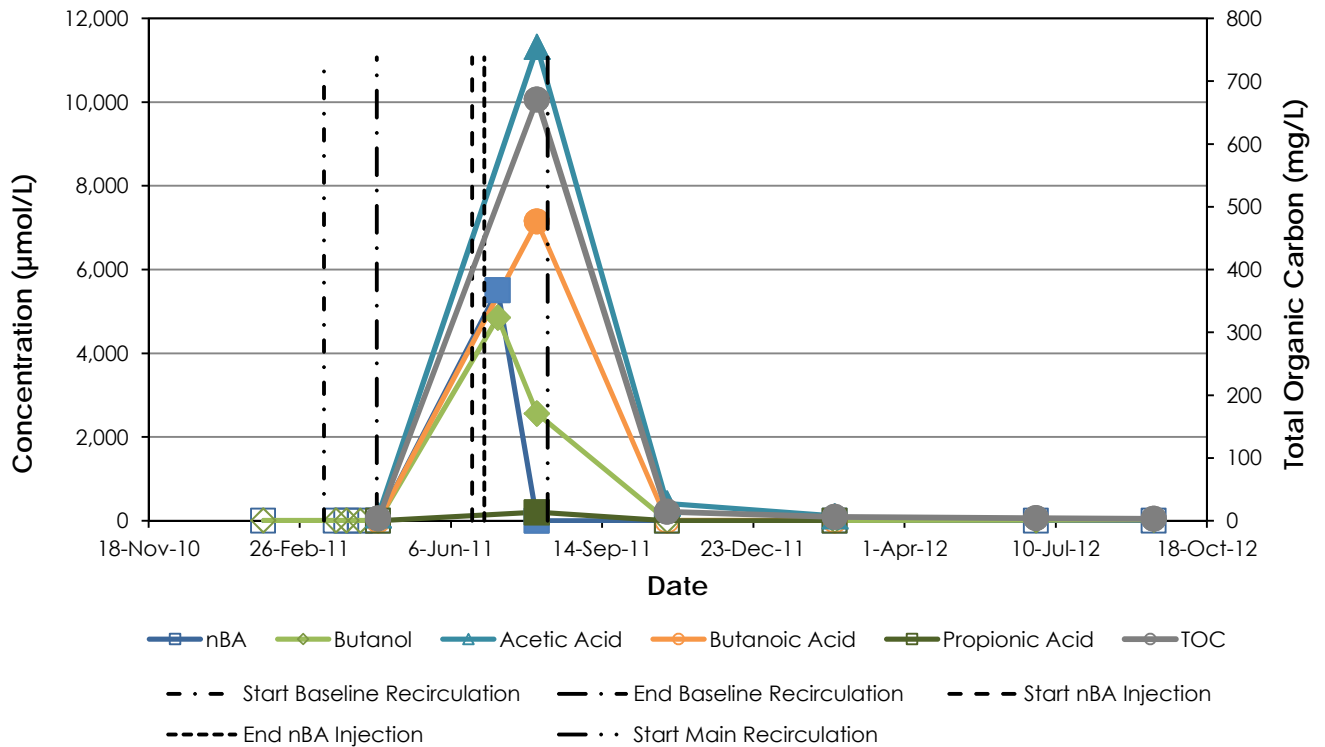
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



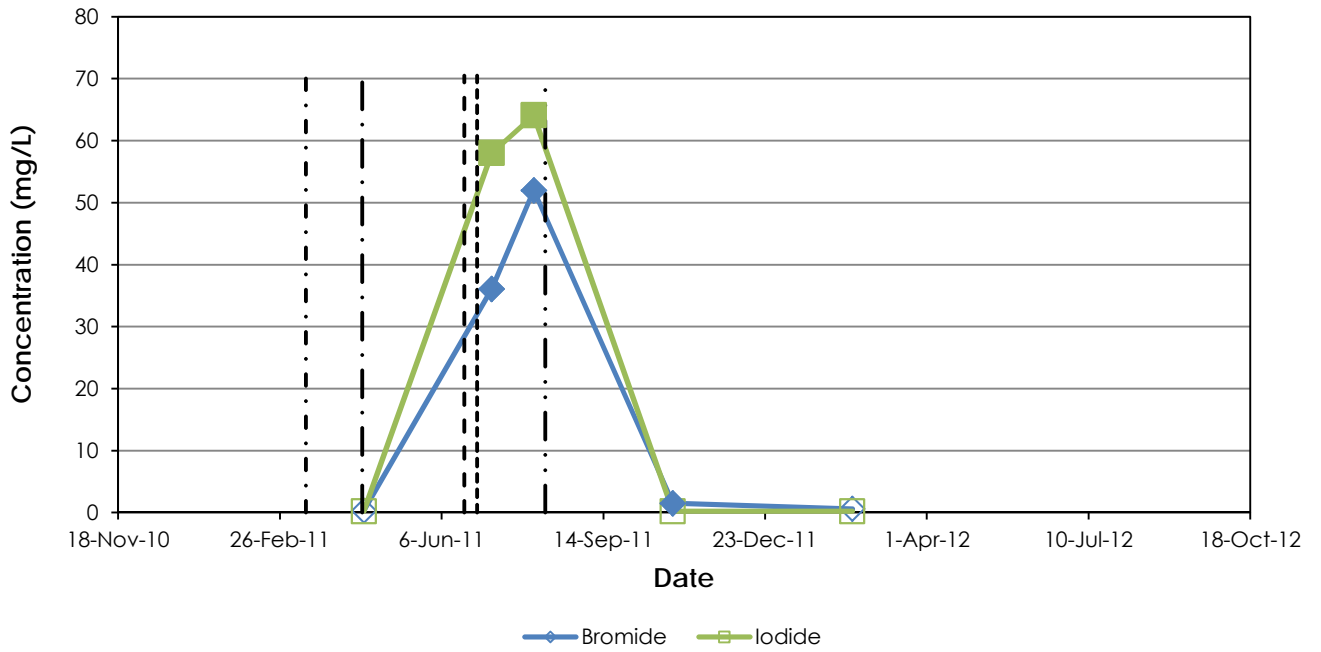
Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

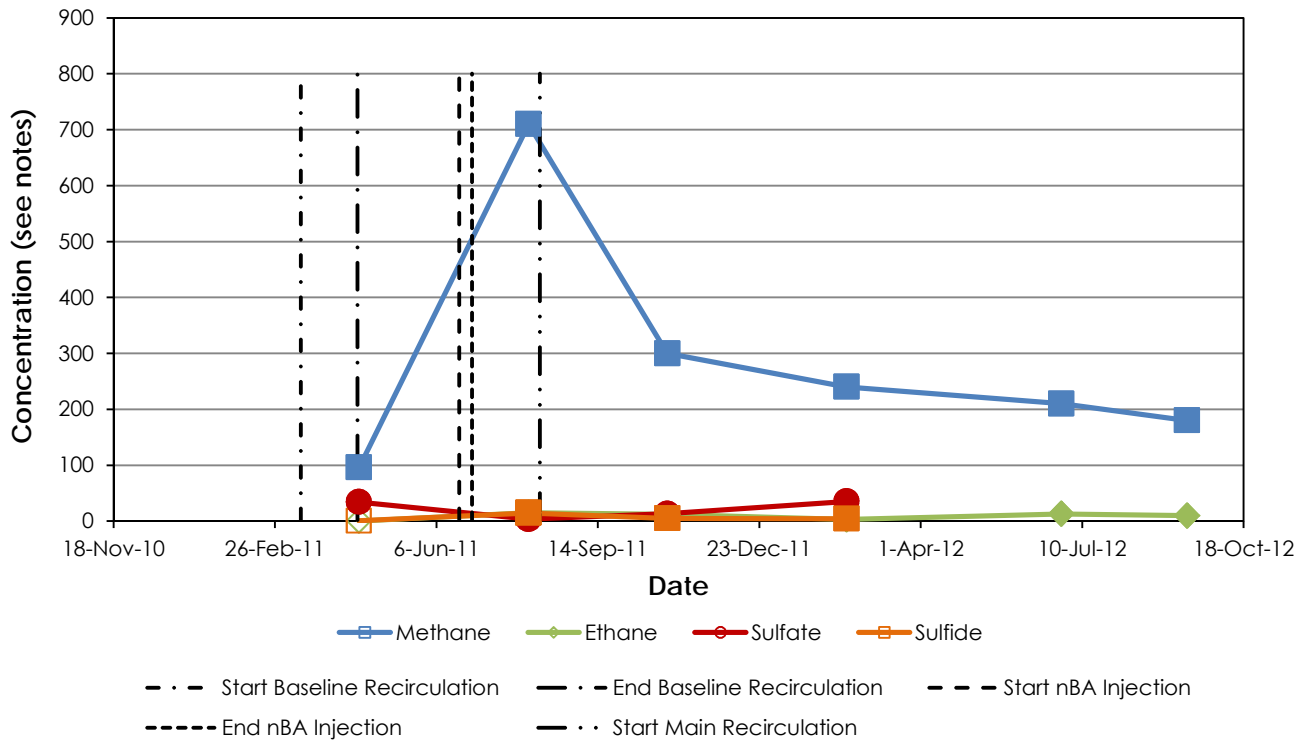
BW0003C - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-15a	

\\Guelph-01\Data\PRJ\Projects\TR0272 - ESTCP_PED\12 Field Demo - LC34\DATA\071 Database & GIS\GuelphOutput\TimeTrendsPlots_20130118\BW0003C.xlsx[Plot 1

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003C - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



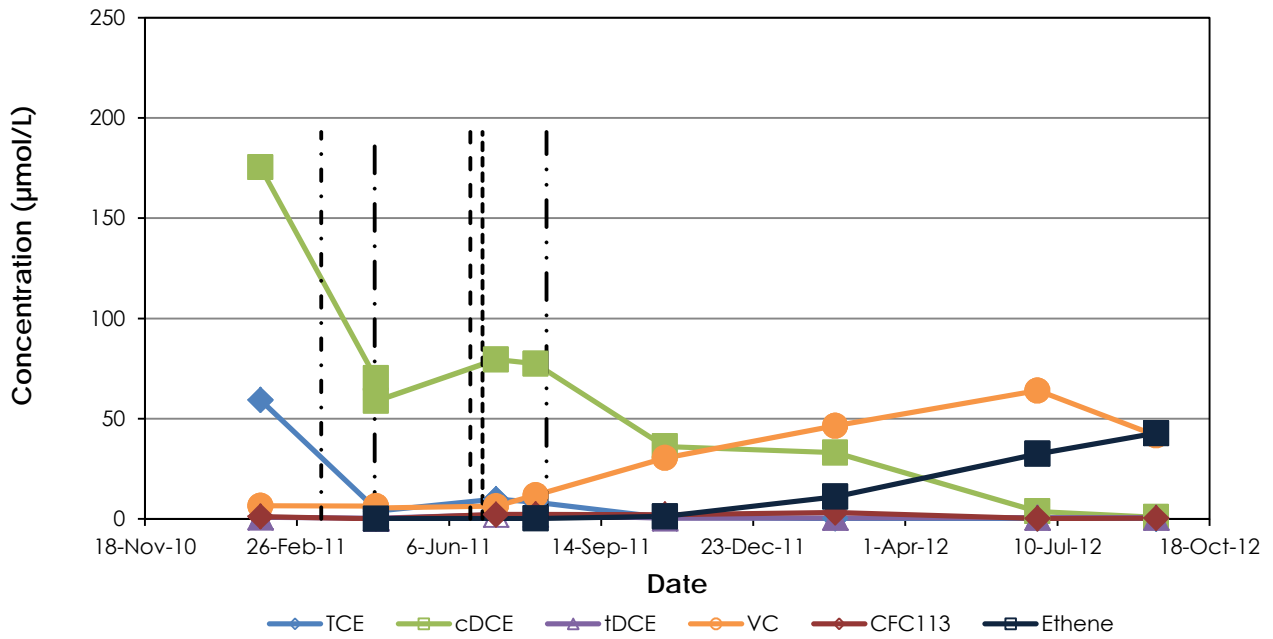
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E-2-15b

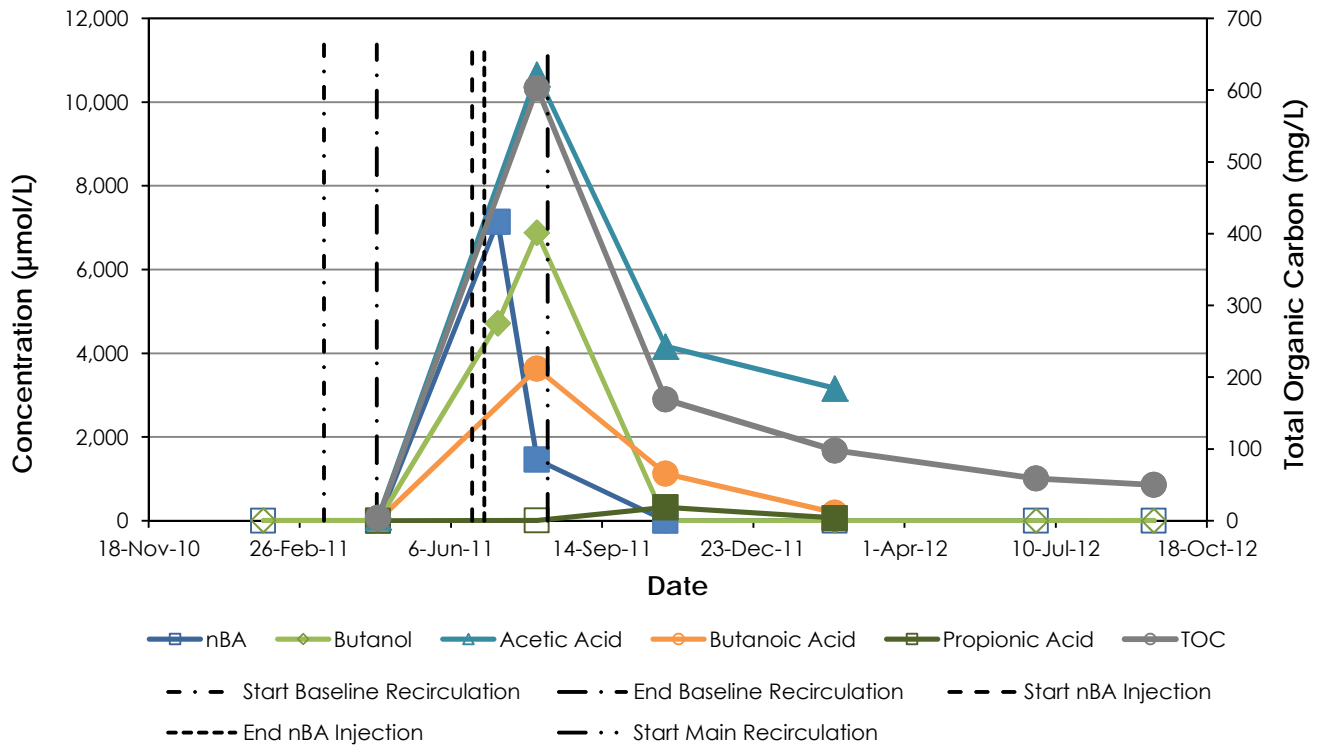
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003D - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



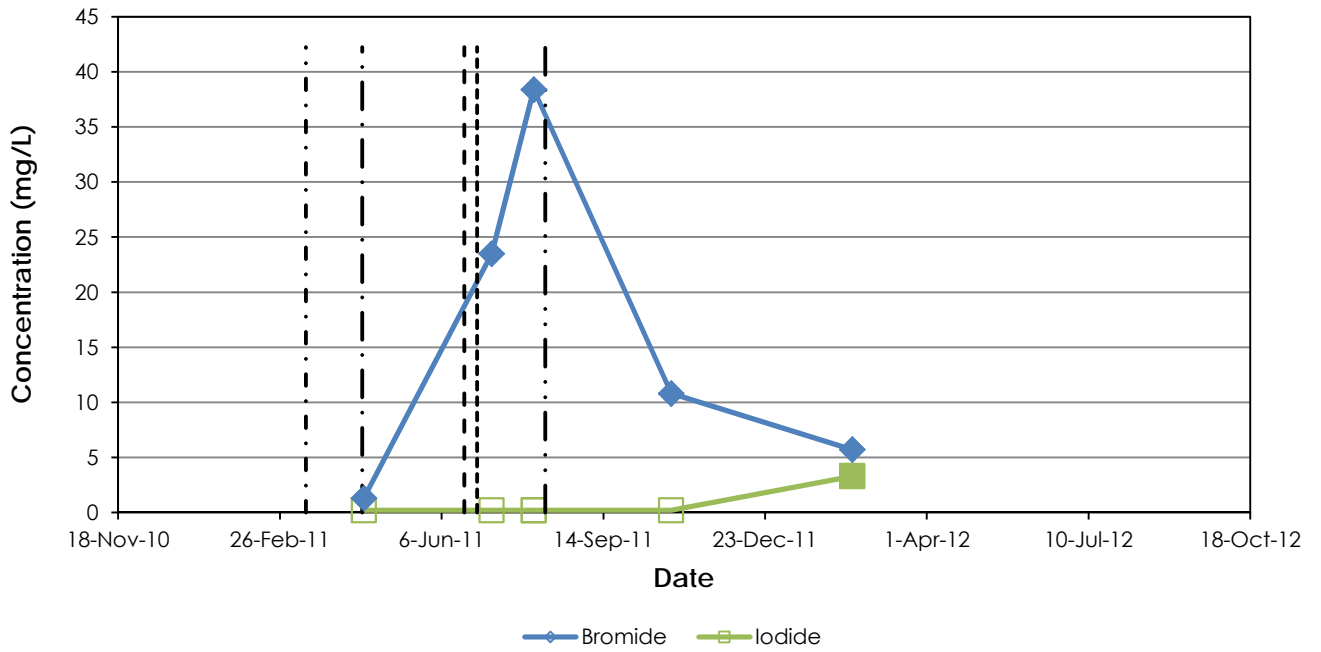
Figure

E-2-16a

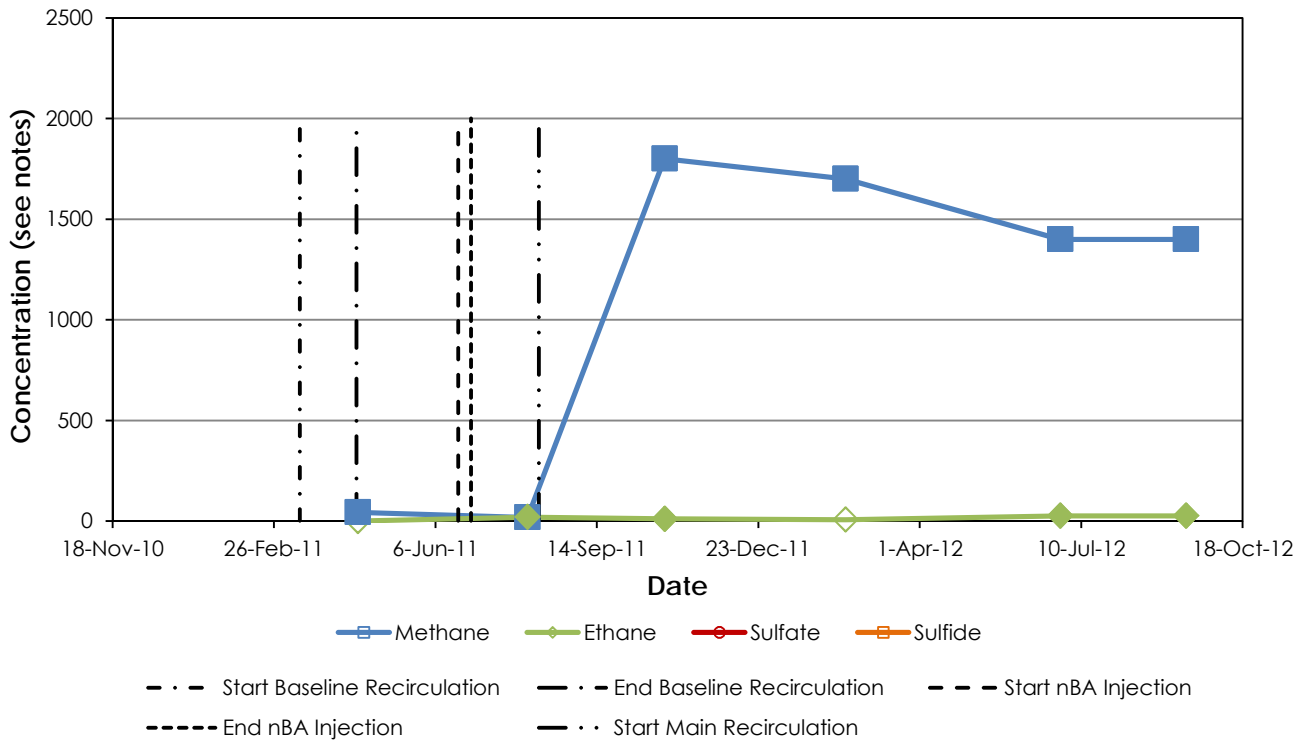
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003D - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



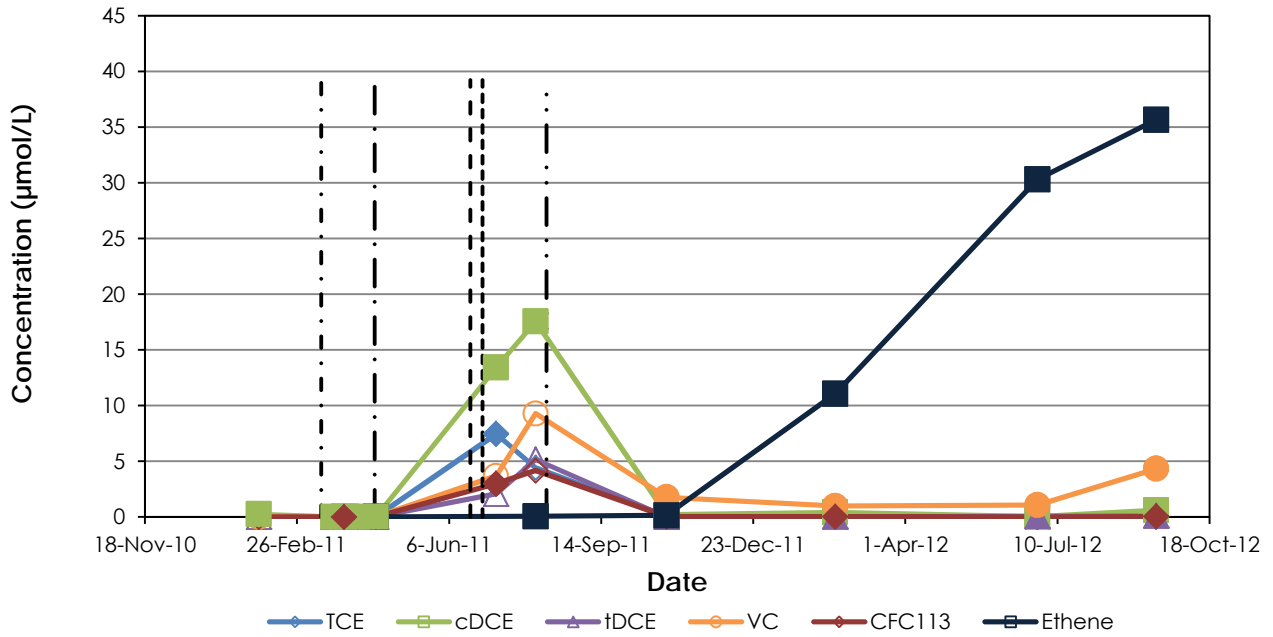
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E-2-16b

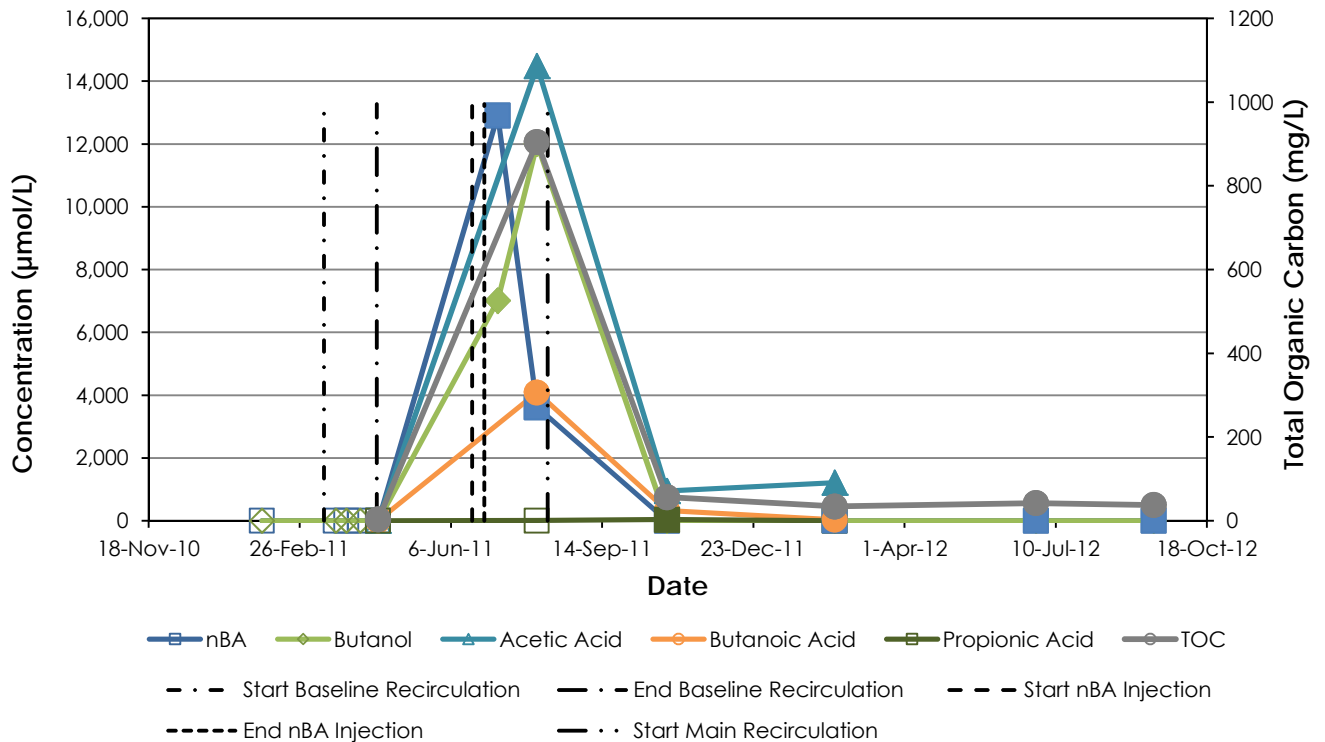
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

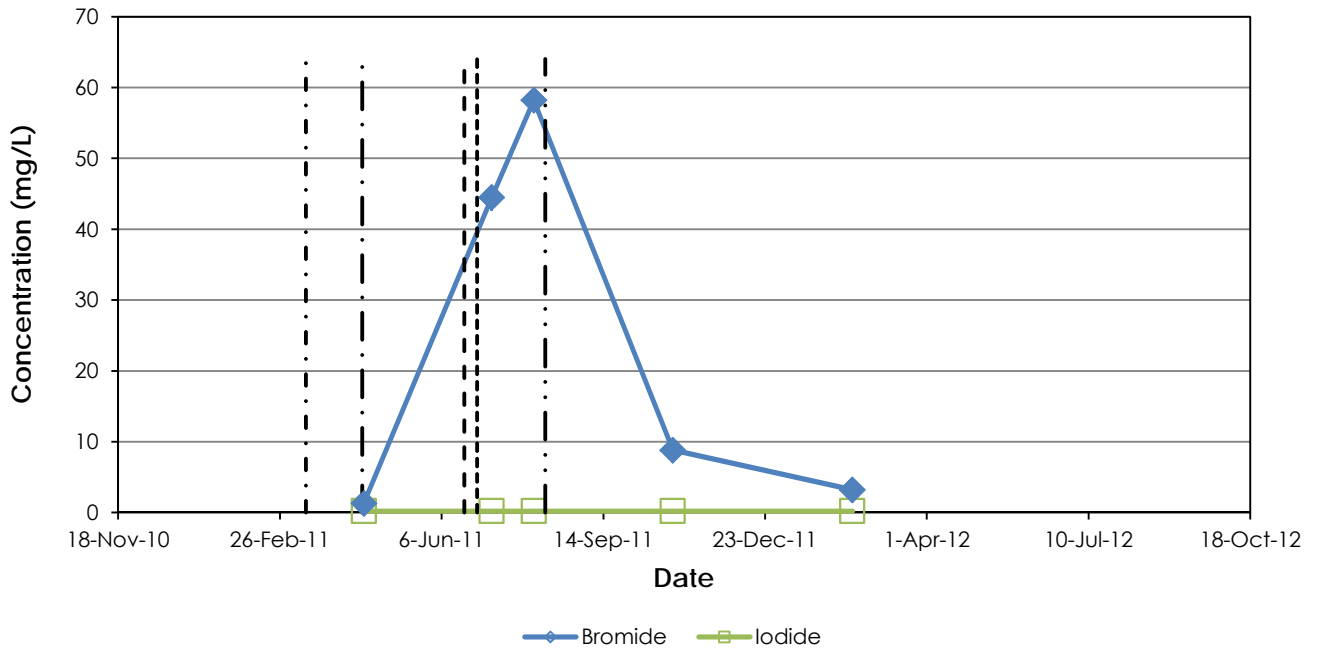


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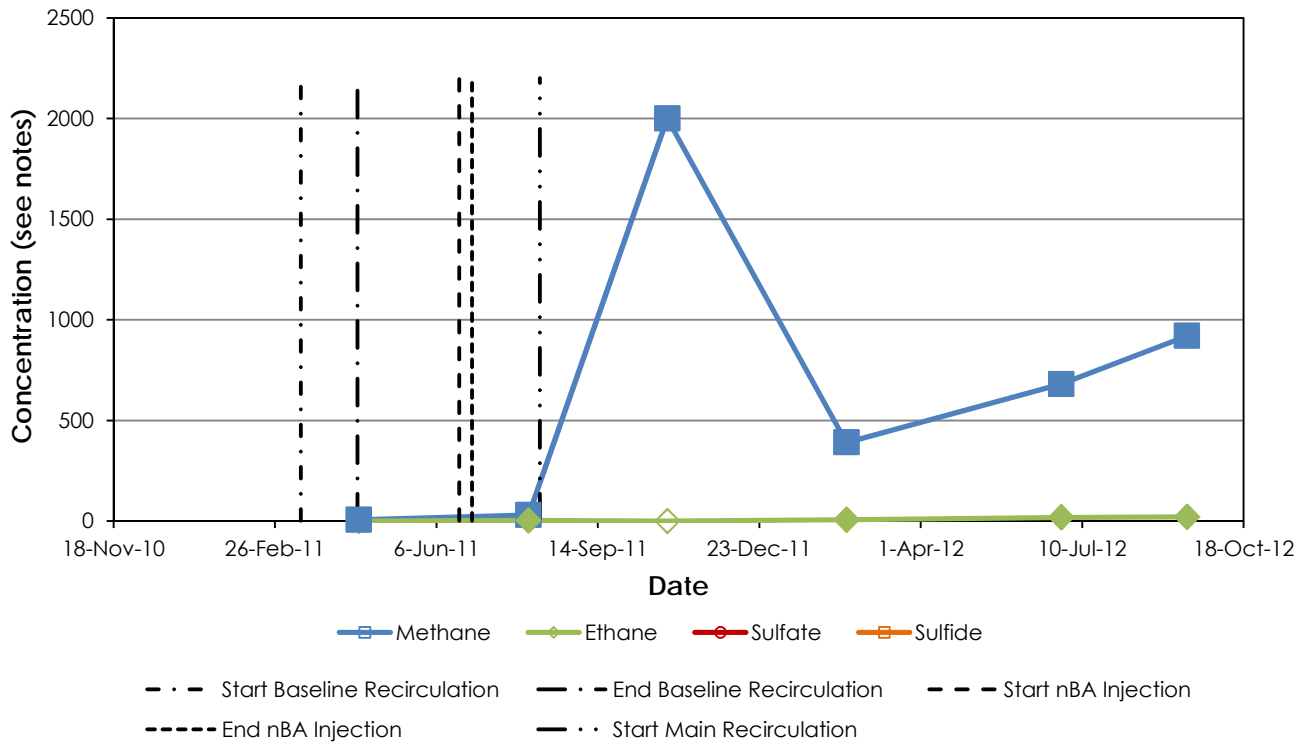
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003E - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-17a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003E - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



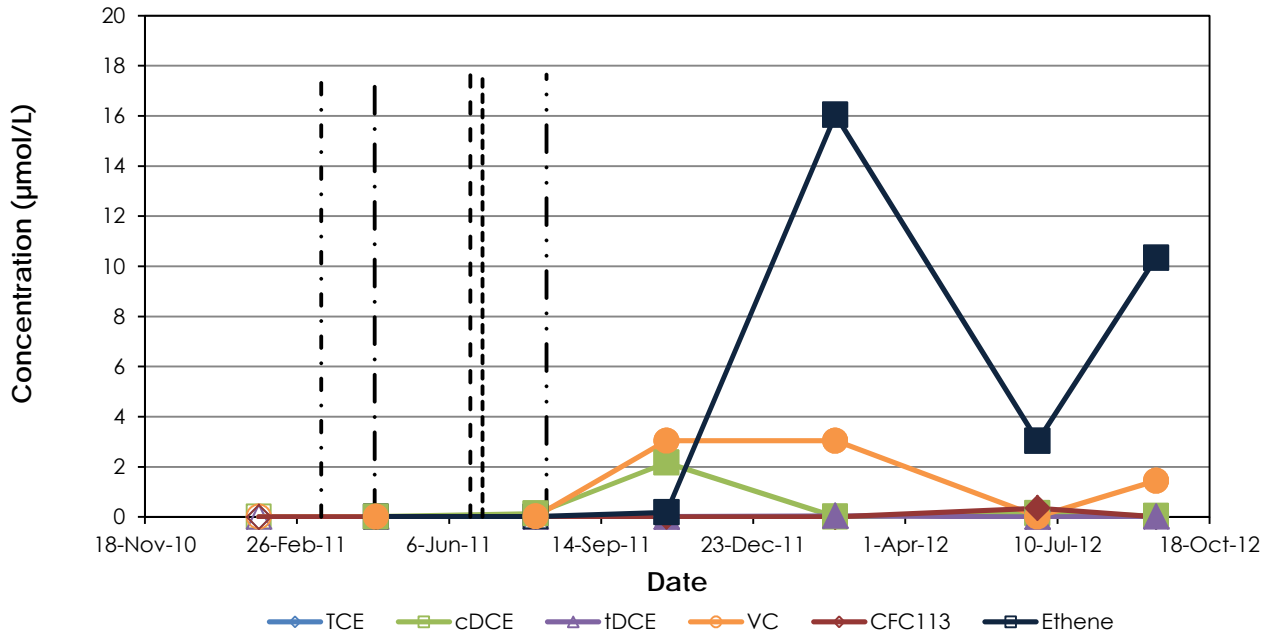
Figure

E-2-17b

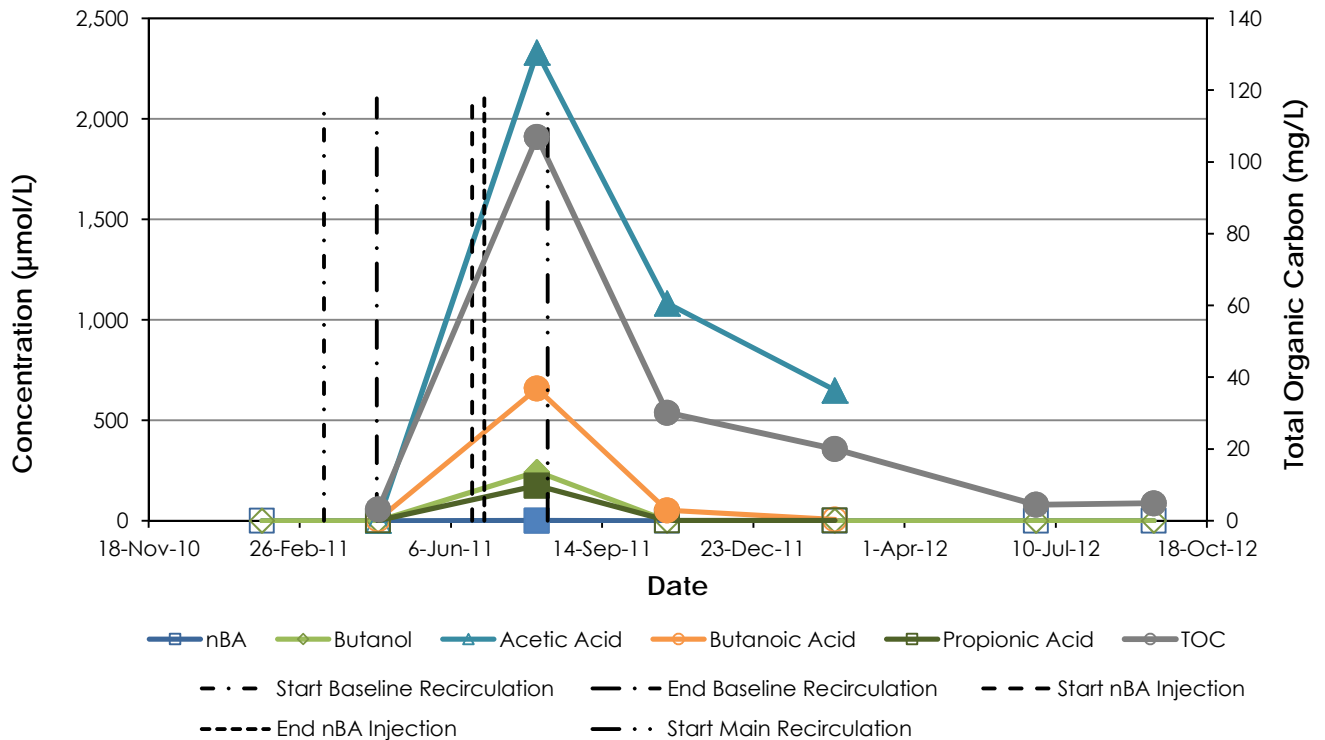
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

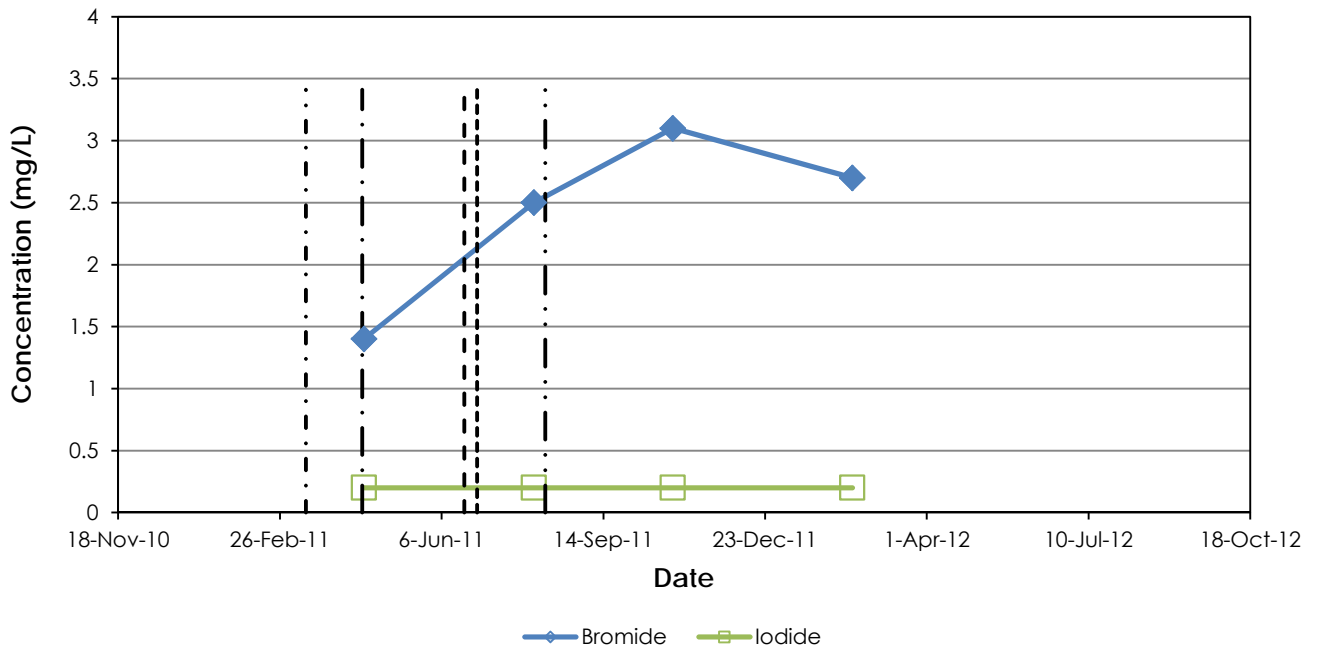


Notes:

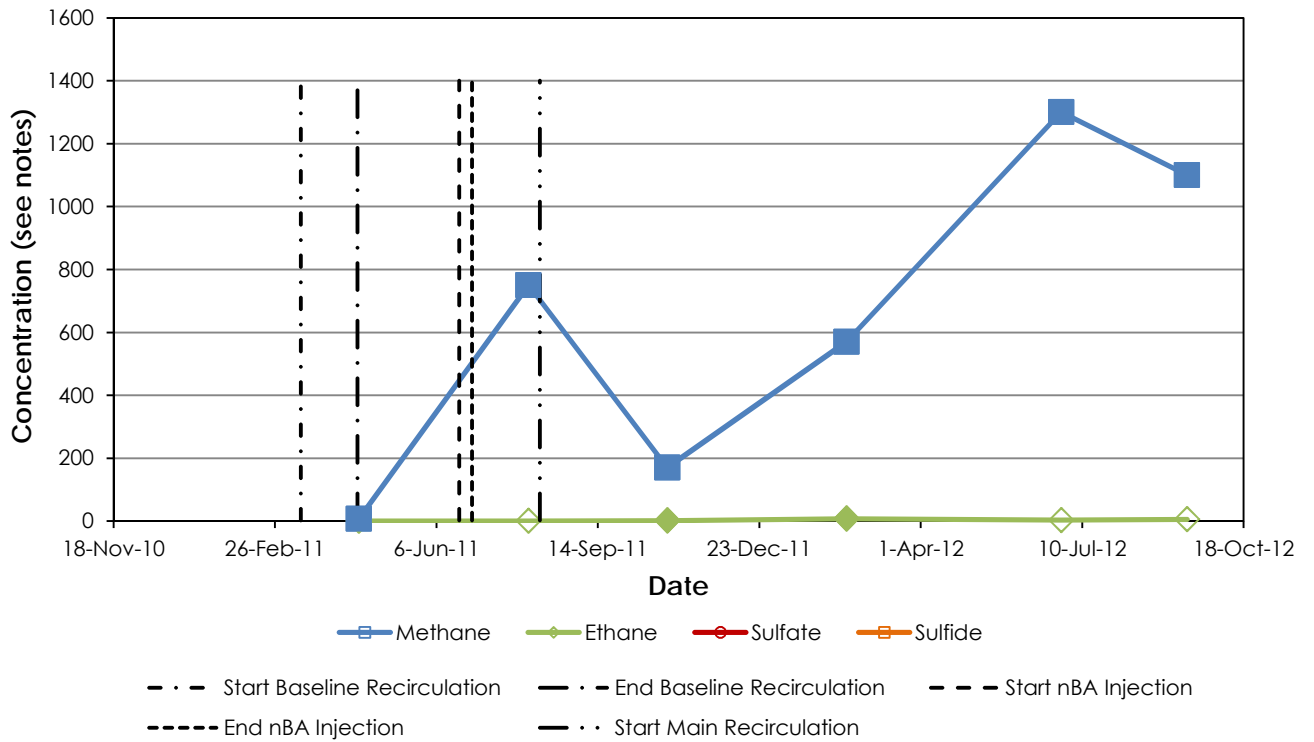
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003F - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-18a	

C) Tracers



D) Geochemical Parameters



Notes:

mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

BW0003F - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



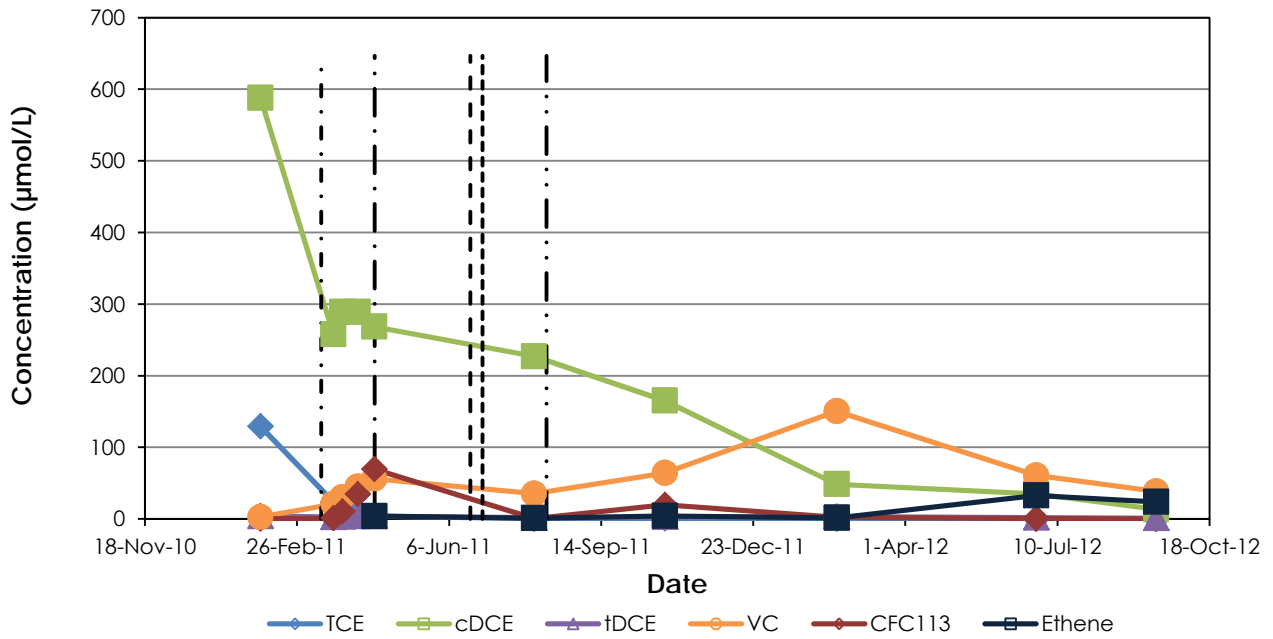
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E-2-18b

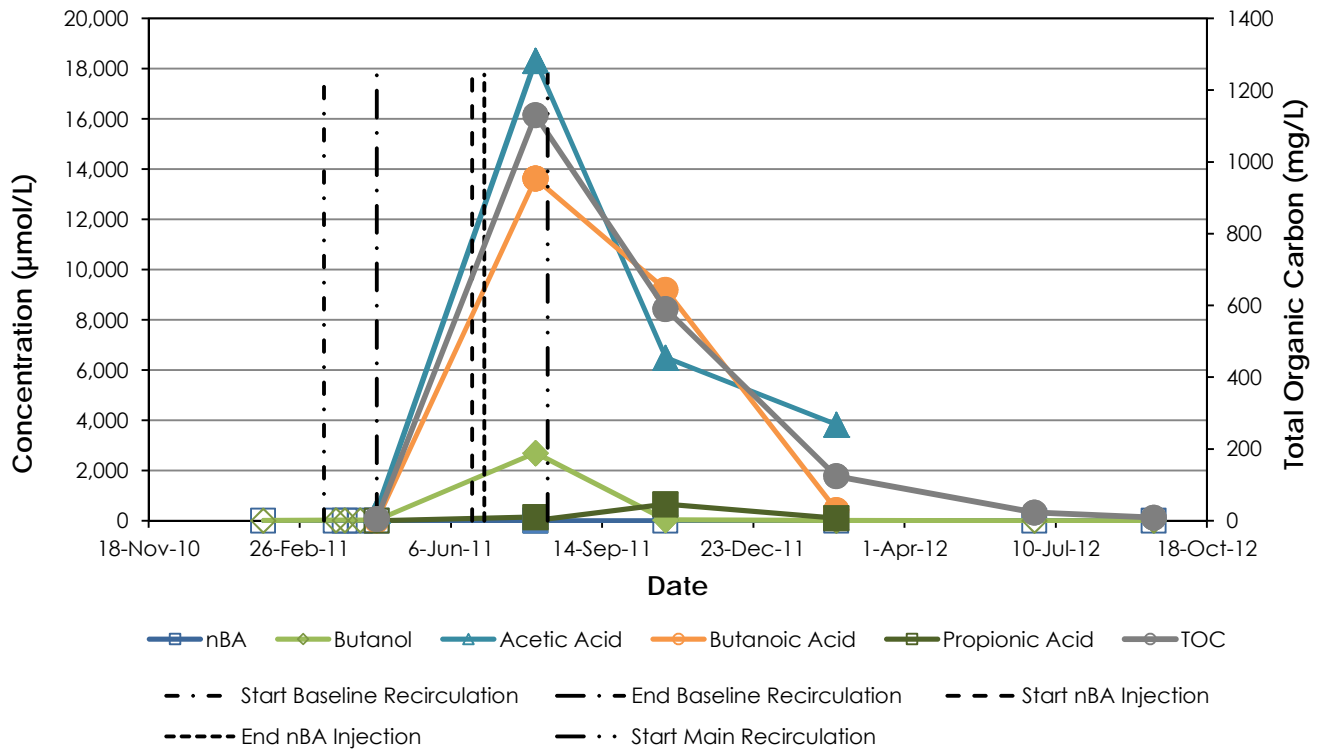
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids

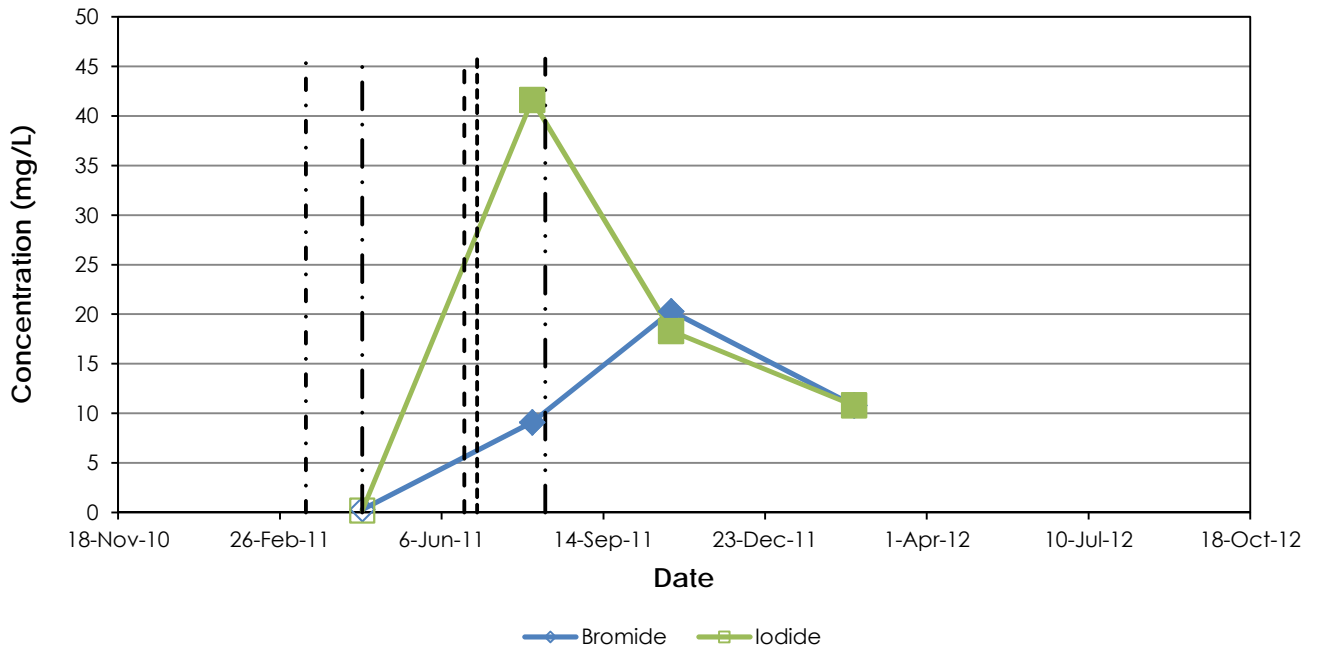


Notes:

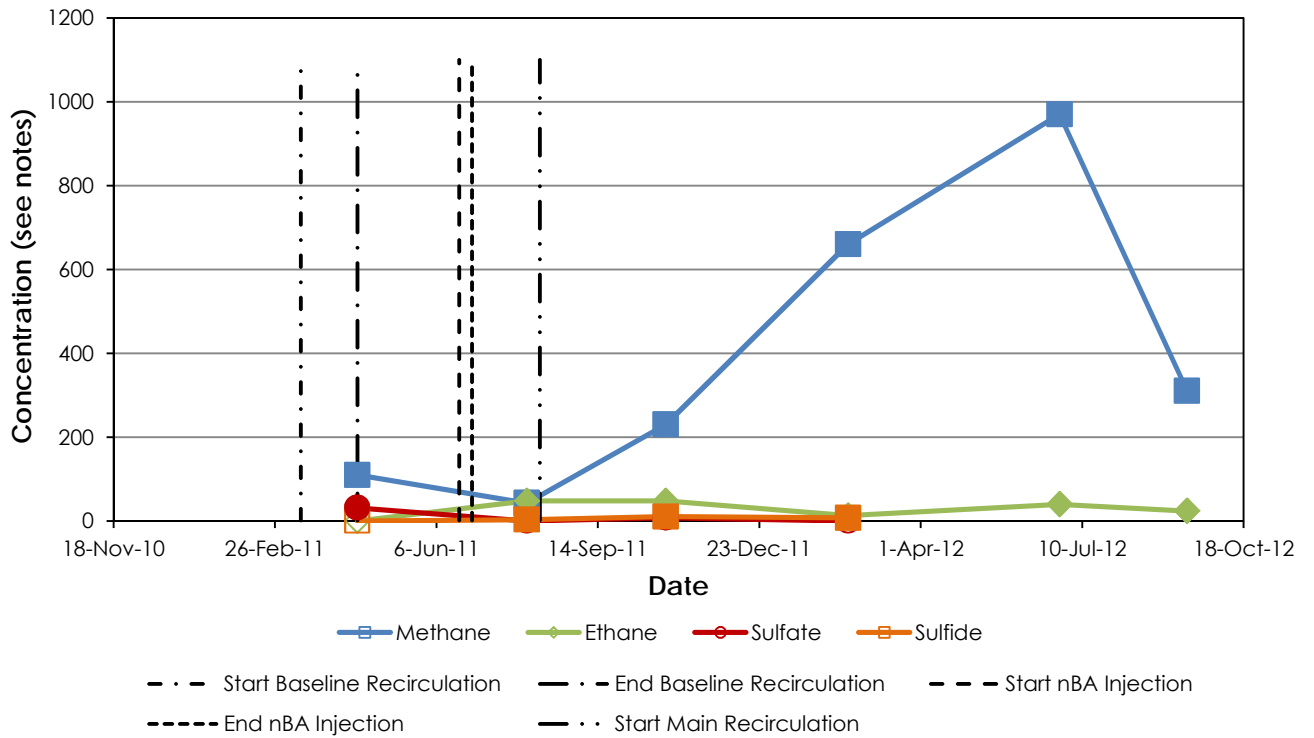
µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

IW0002D - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Figure E-2-19a	

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

IW0002D - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



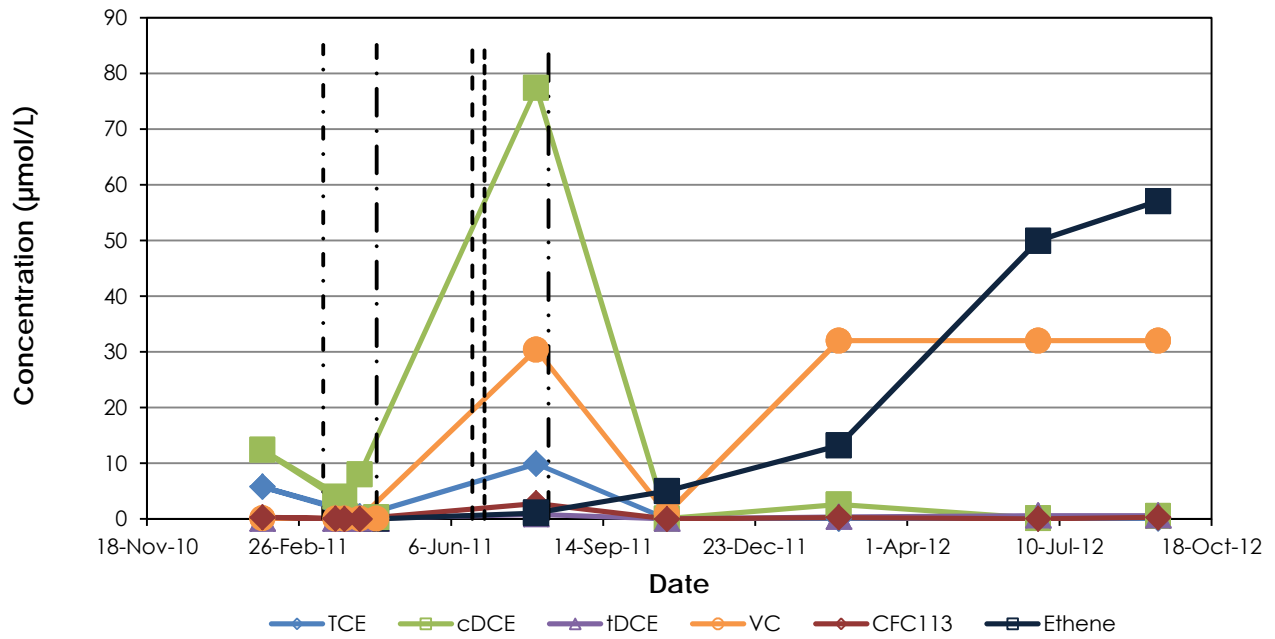
Figure

E-2-19b

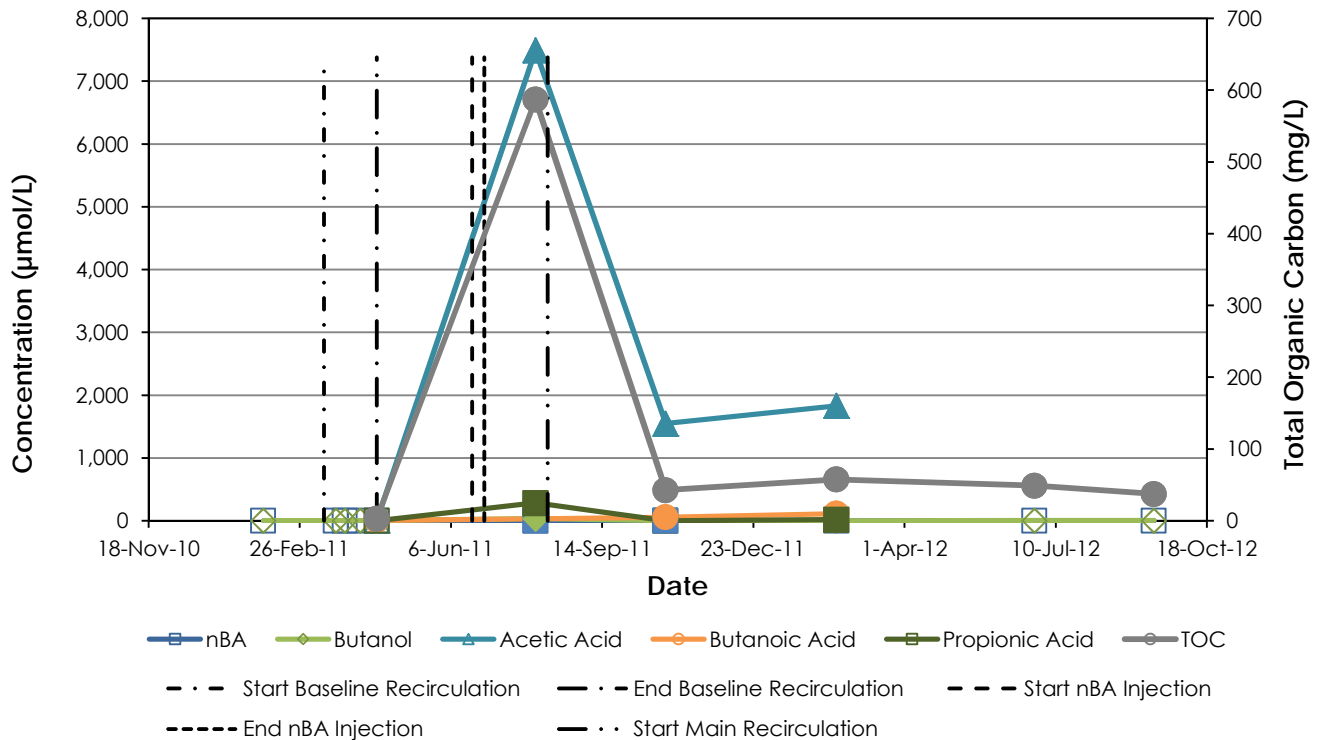
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

IW0002D1 - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



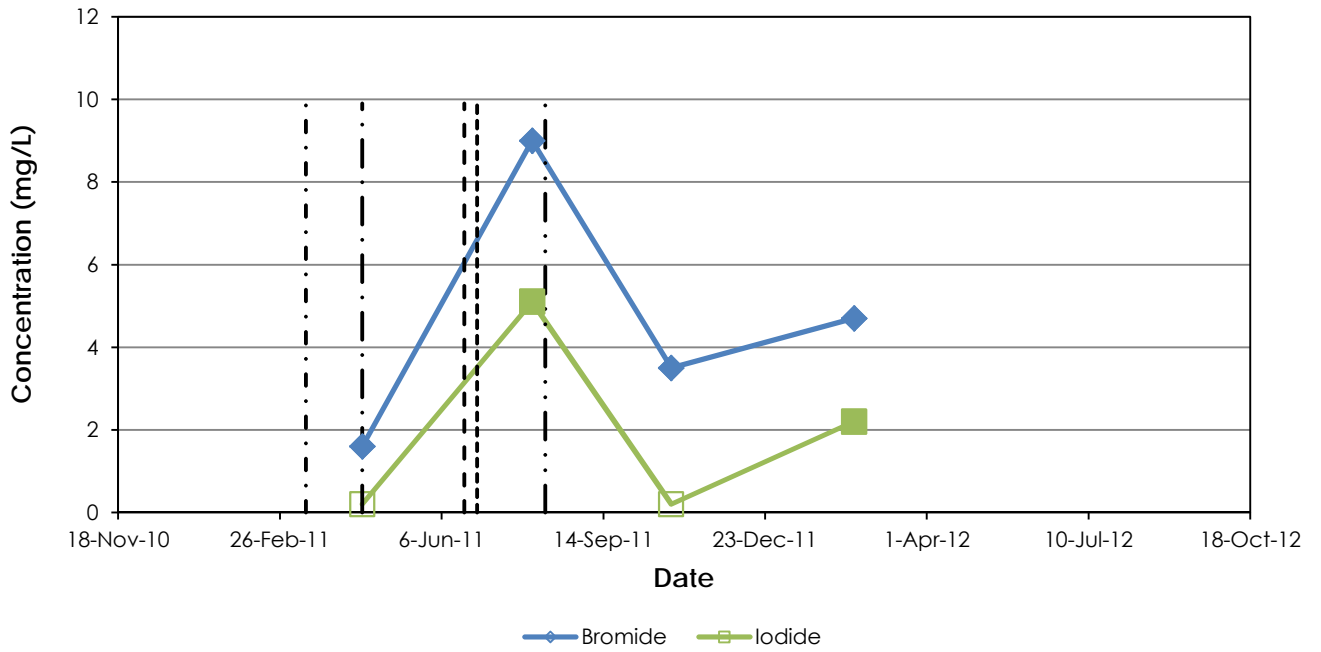
Figure

E-2-20a

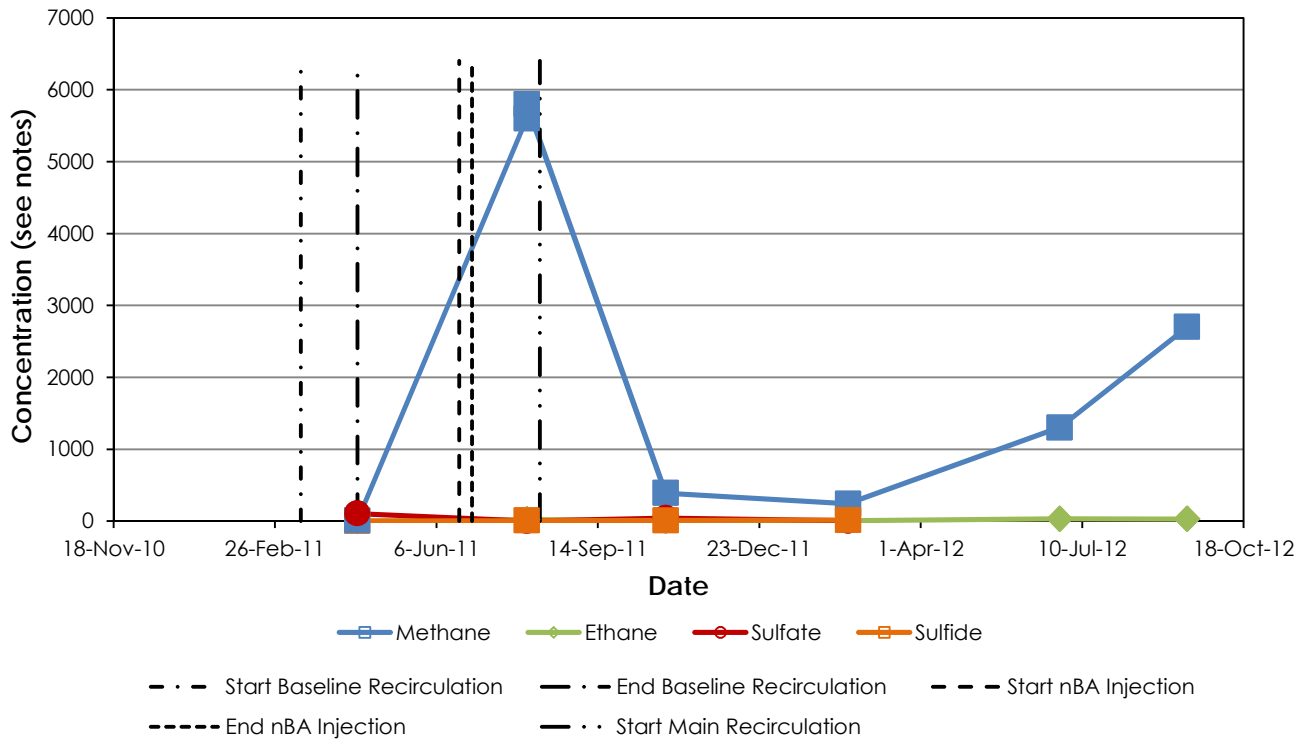
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

IW0002D1 - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



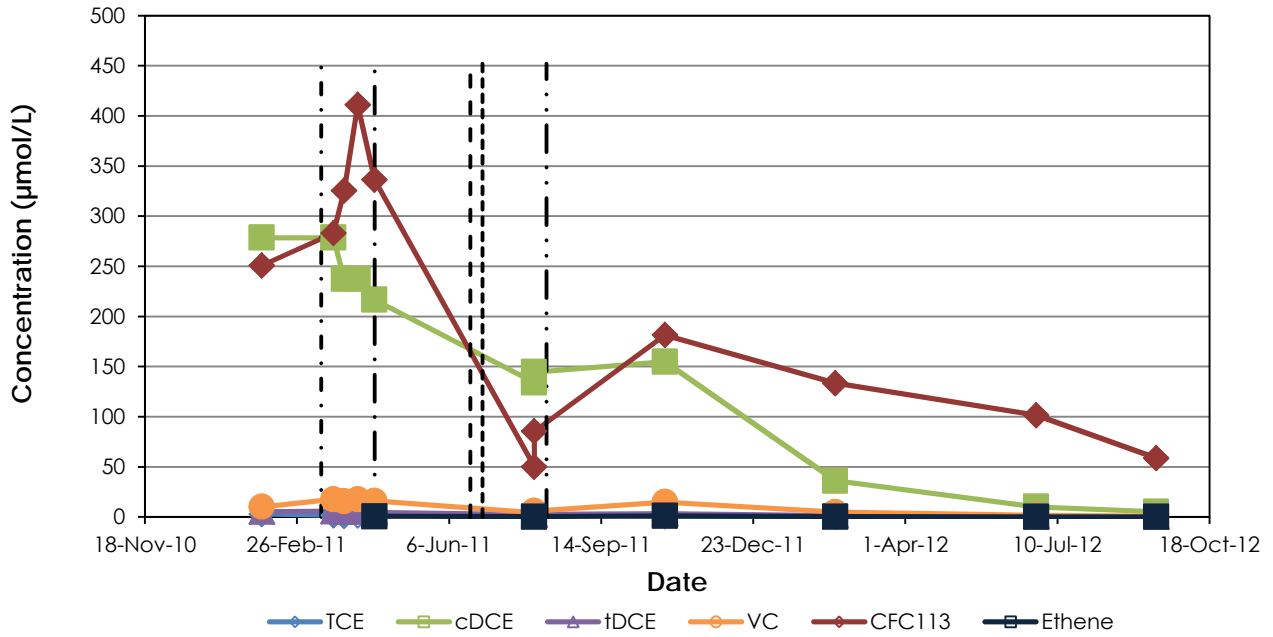
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E-2-20b

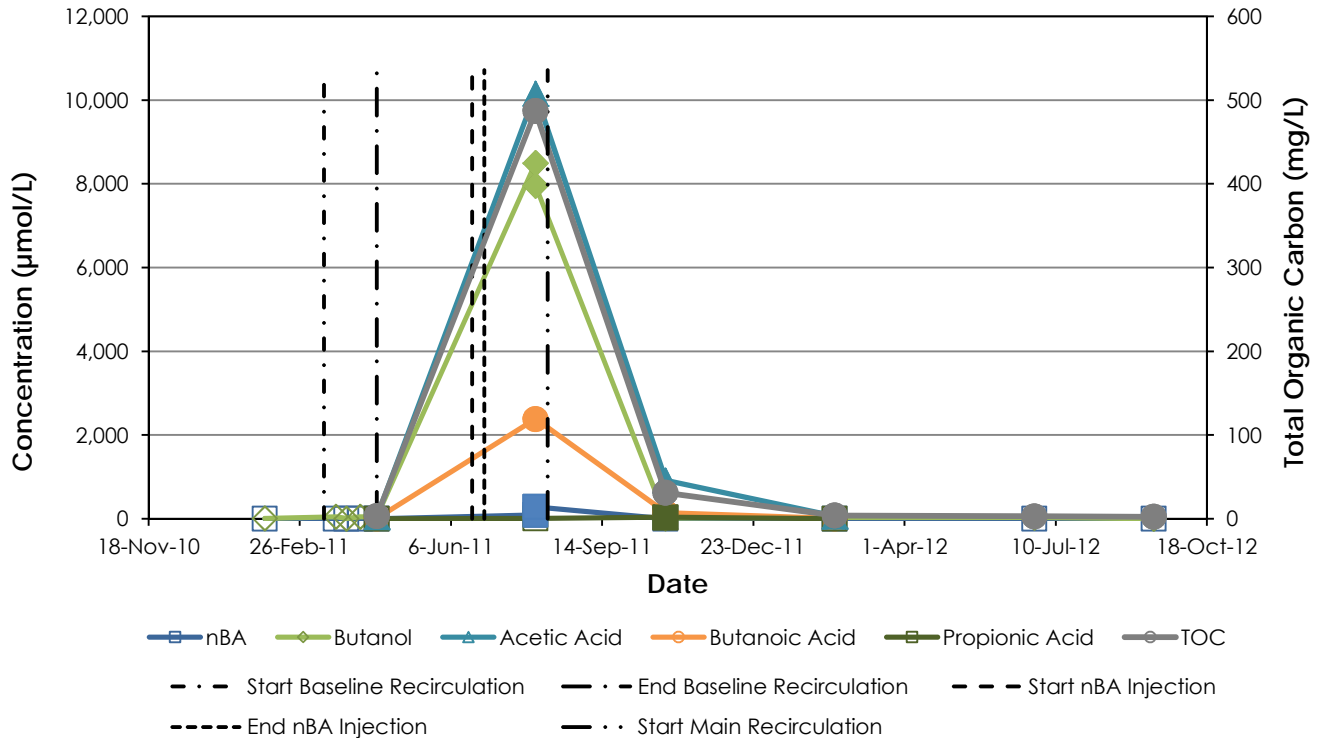
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

IW0002I - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



Figure

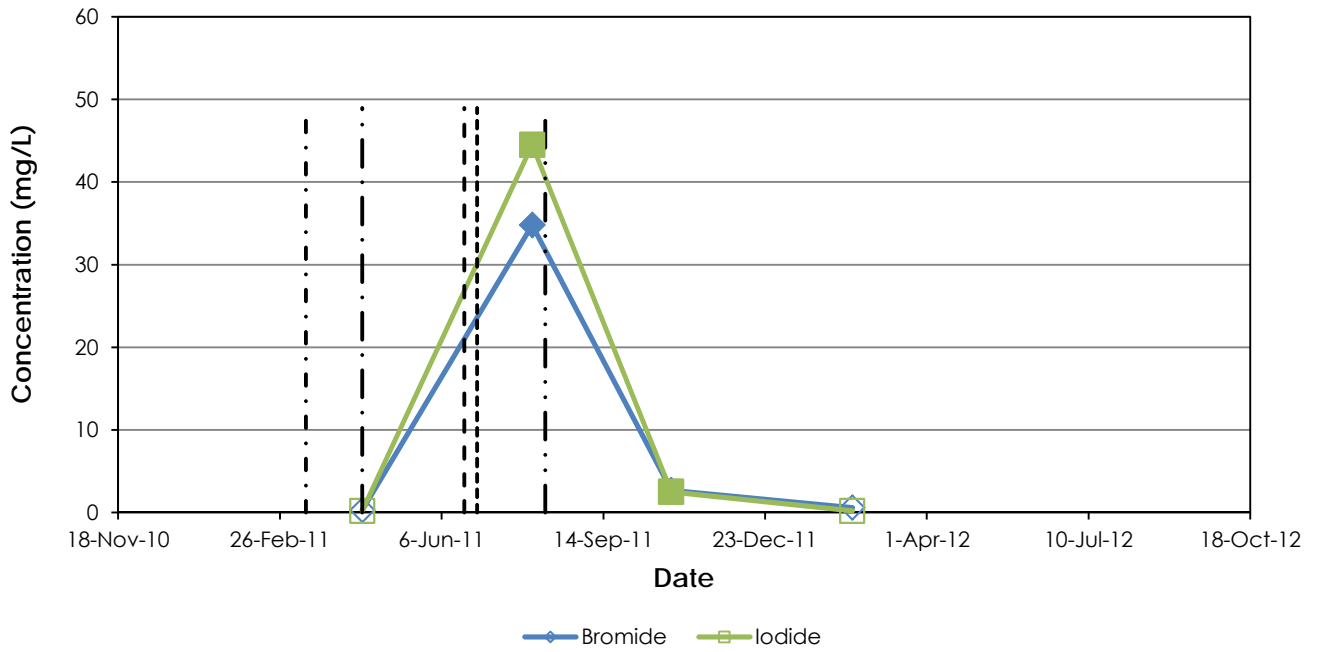
E-2-21a

Guelph

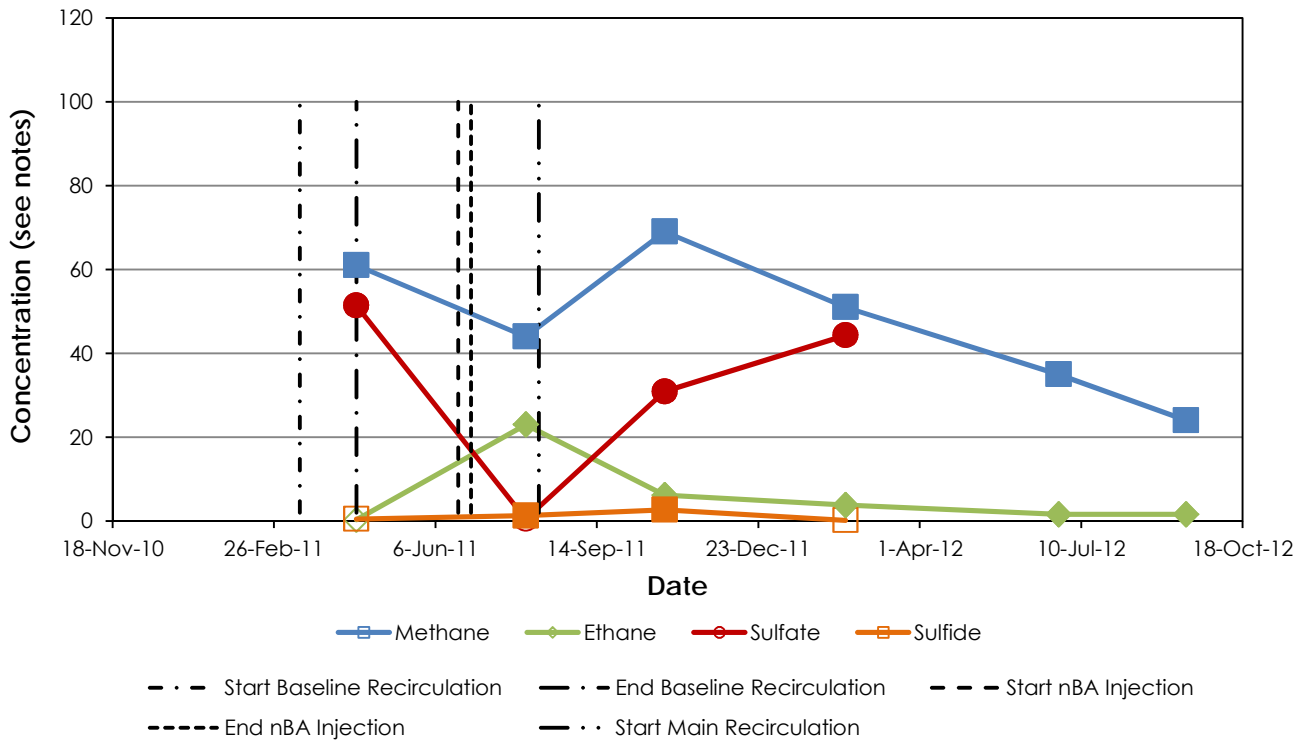
May 2014

\\Guelph-01\Datav\PRJ\Projects\IR0272 - ESTCP_PED\12 Field Demo - LC34\DATA\07 Database & GIS\GuelphOutput\TimeTrendsPlots_20130118\IW0002I.xls:Plot 1

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

IW00021 - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



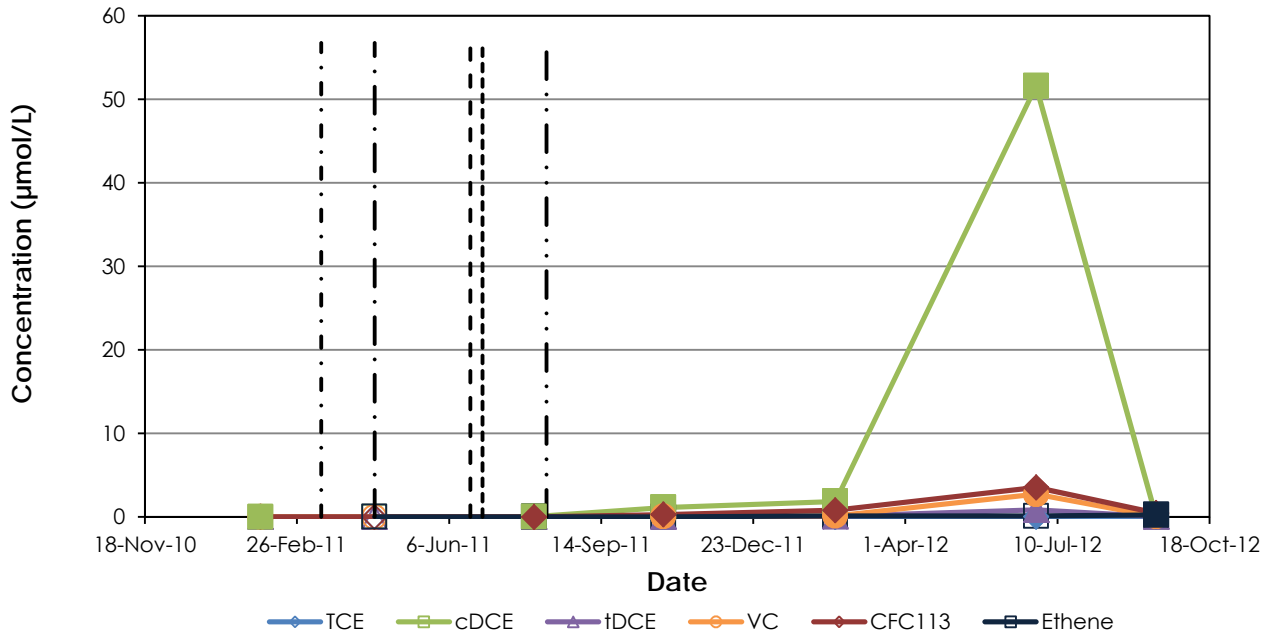
Figure

E-2-21b

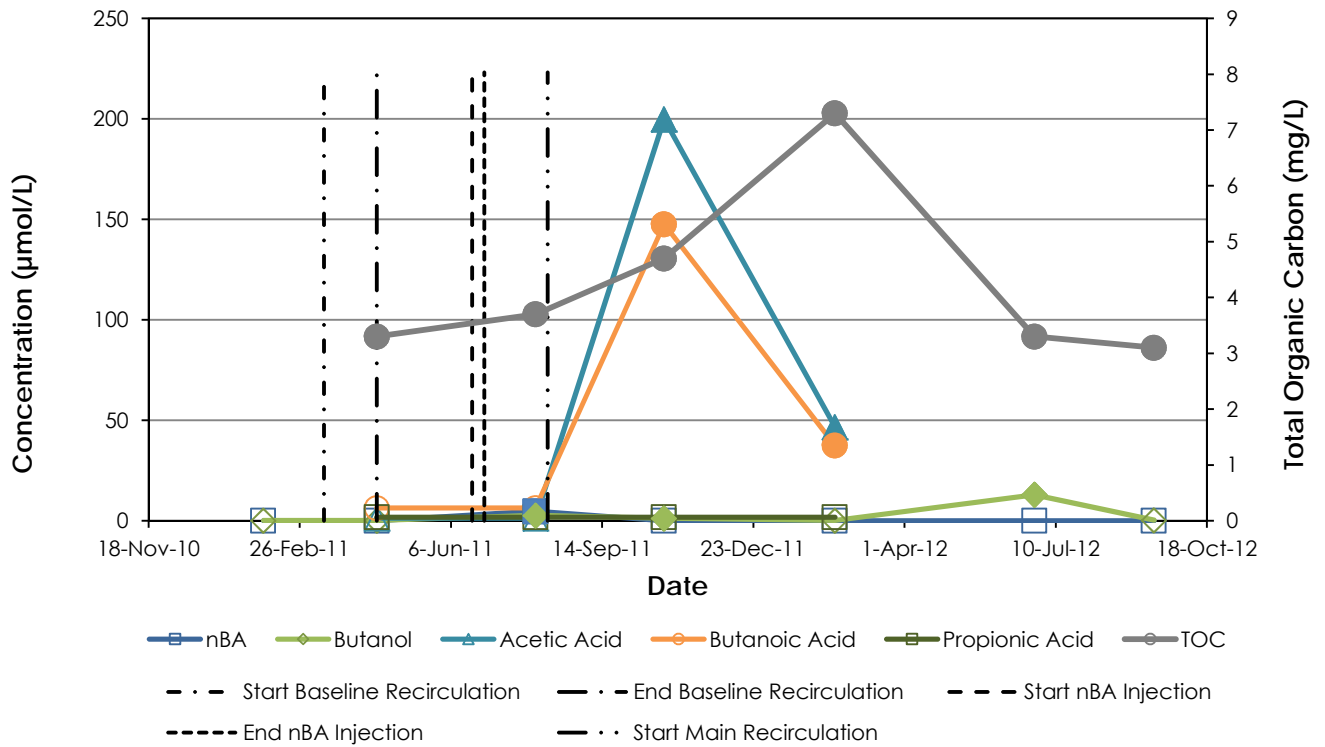
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

IW0076 - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



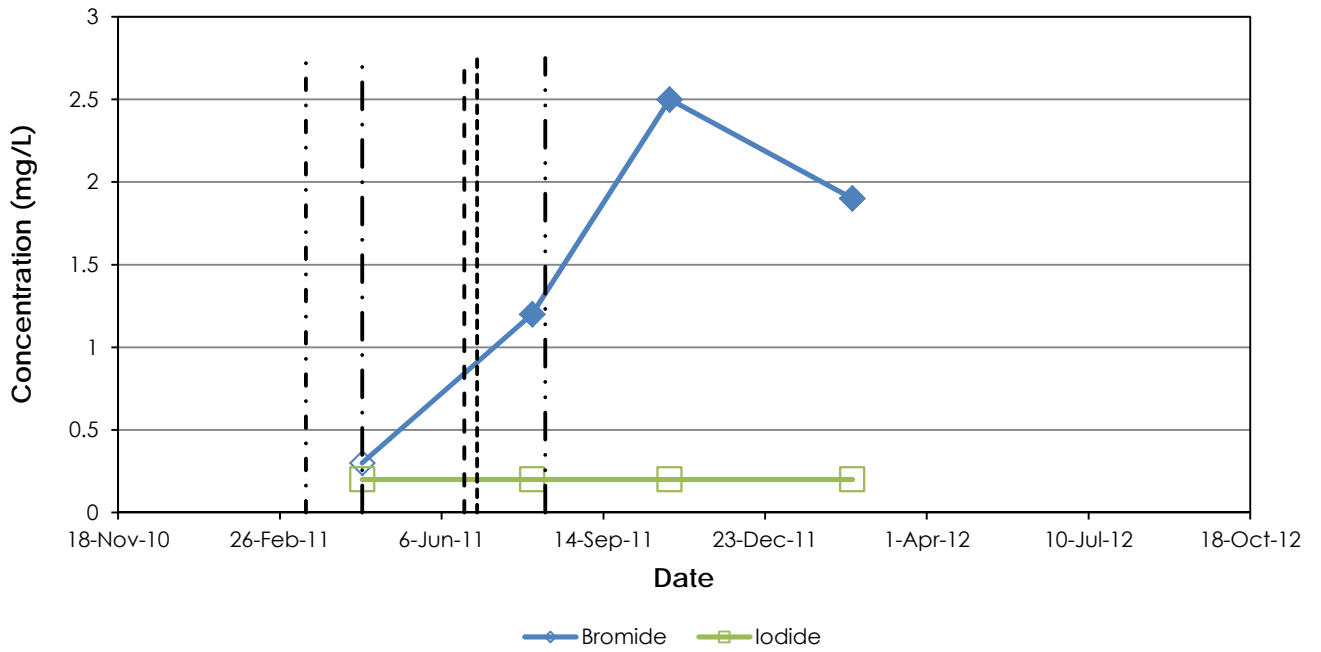
Figure

E-2-22a

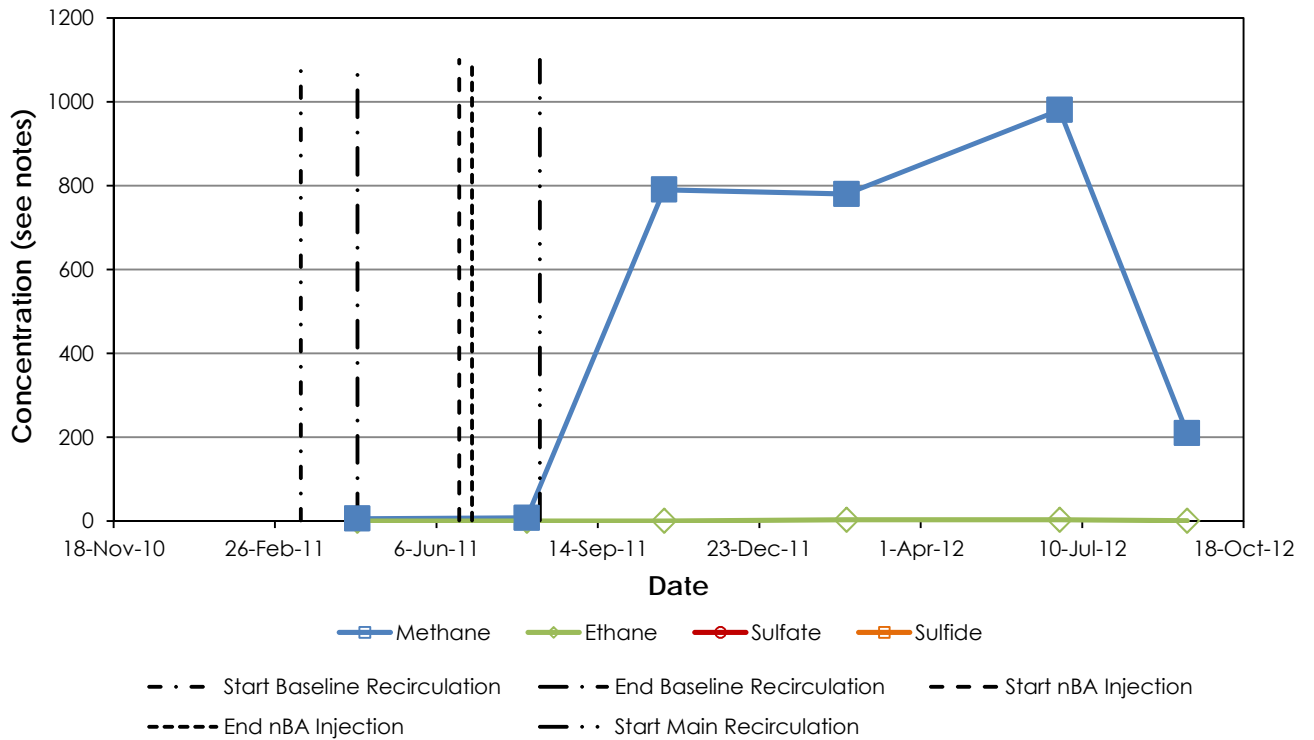
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

IW0076 - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



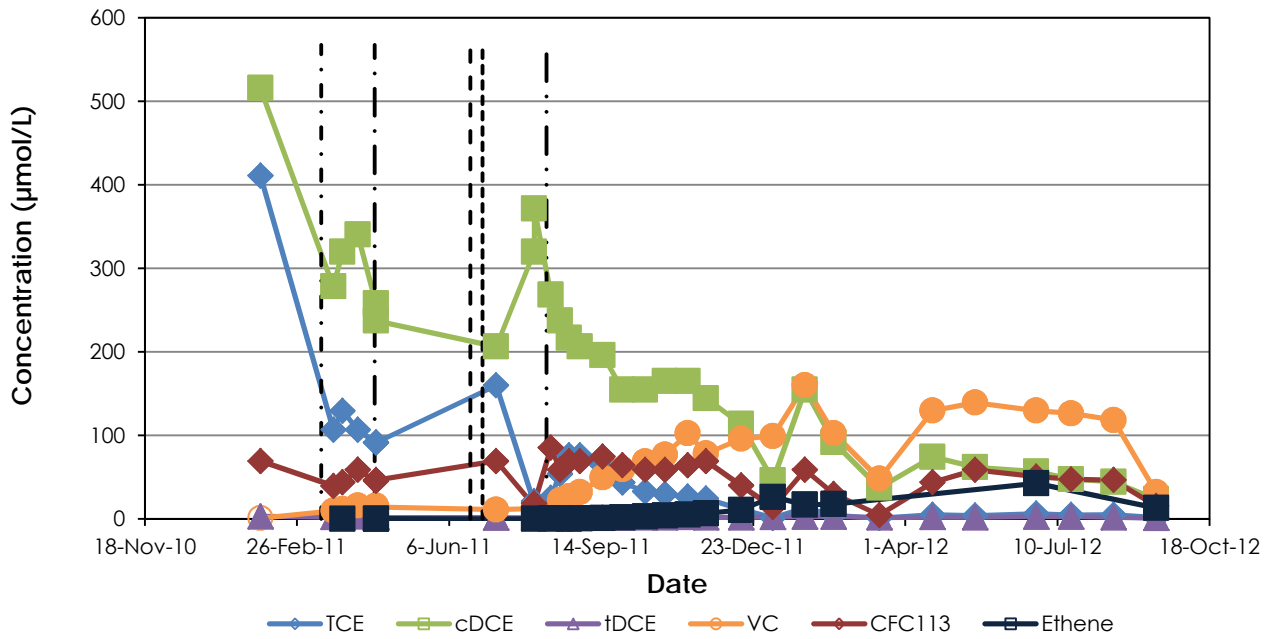
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E-2-22b

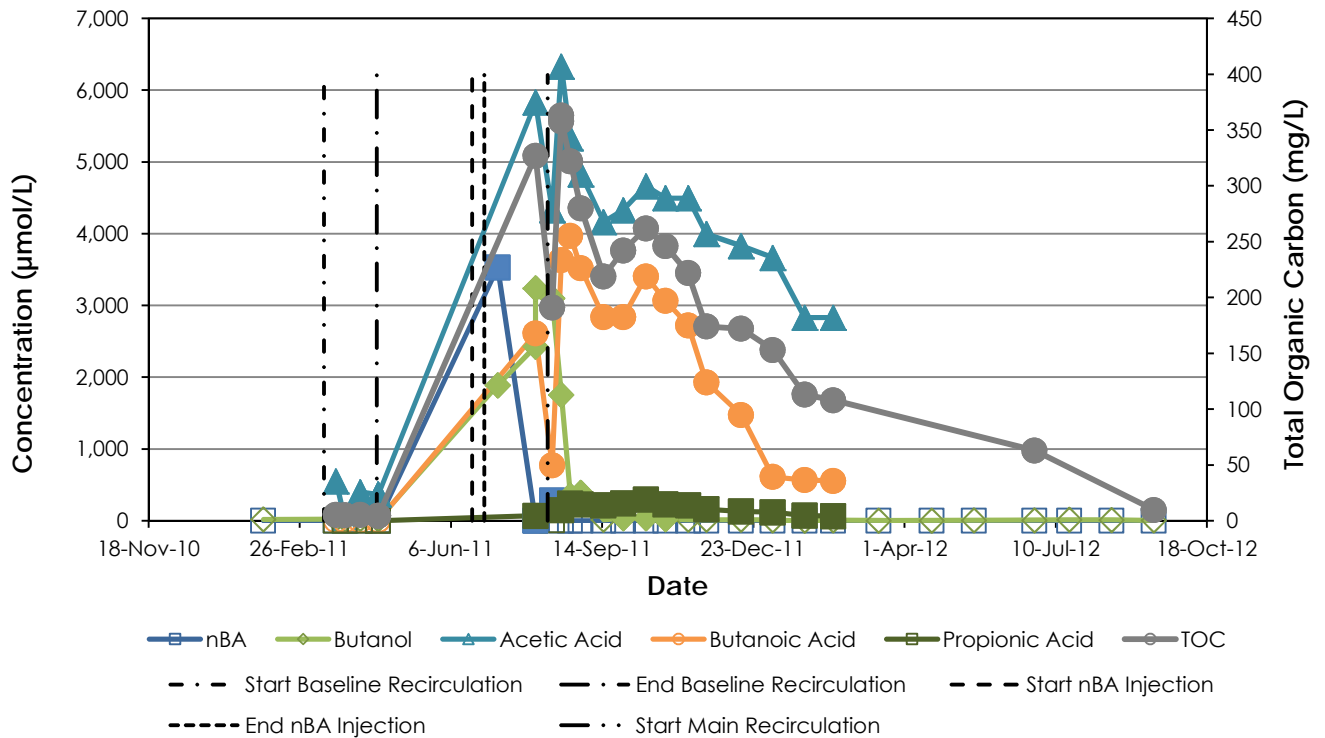
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

RW0007 - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



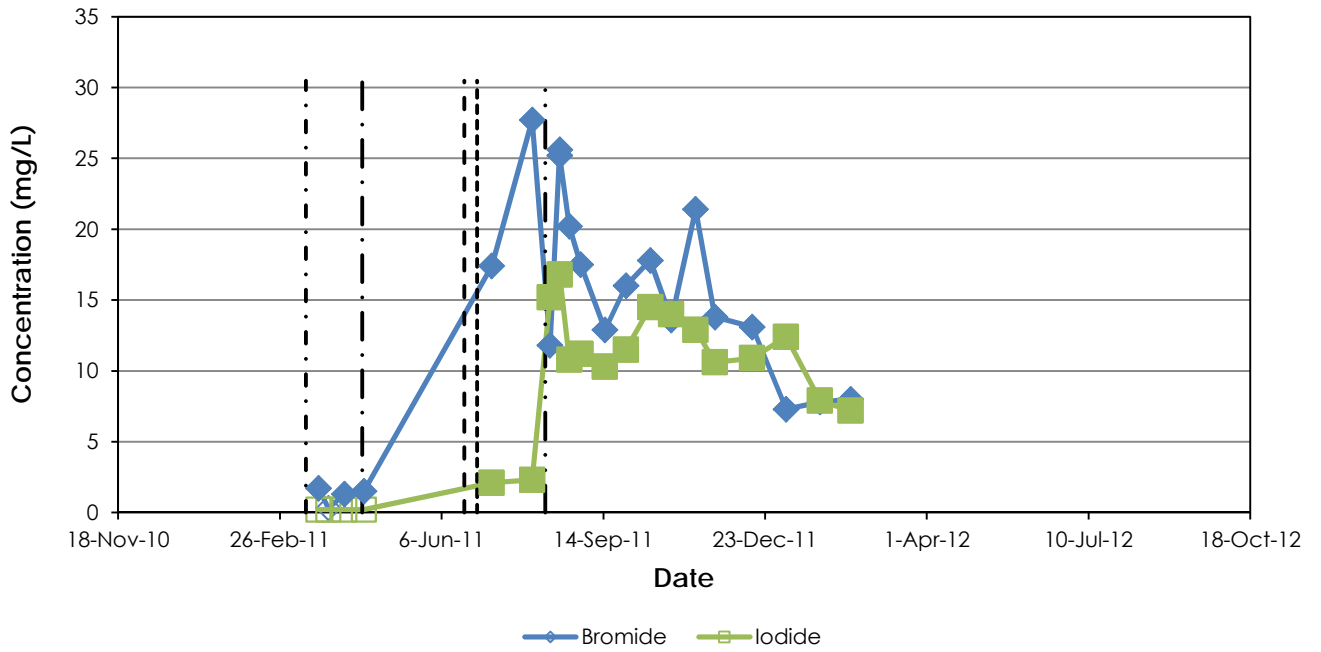
Figure

E-2-23a

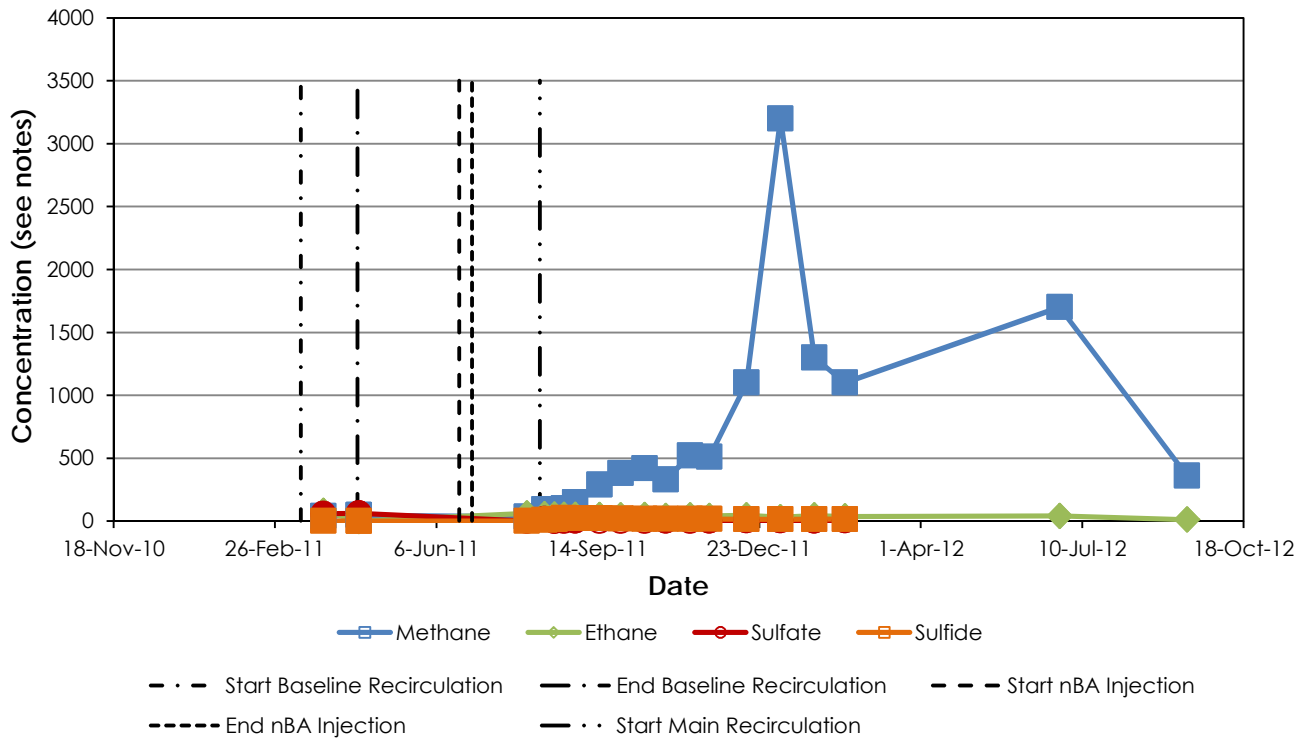
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

RW0007 - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



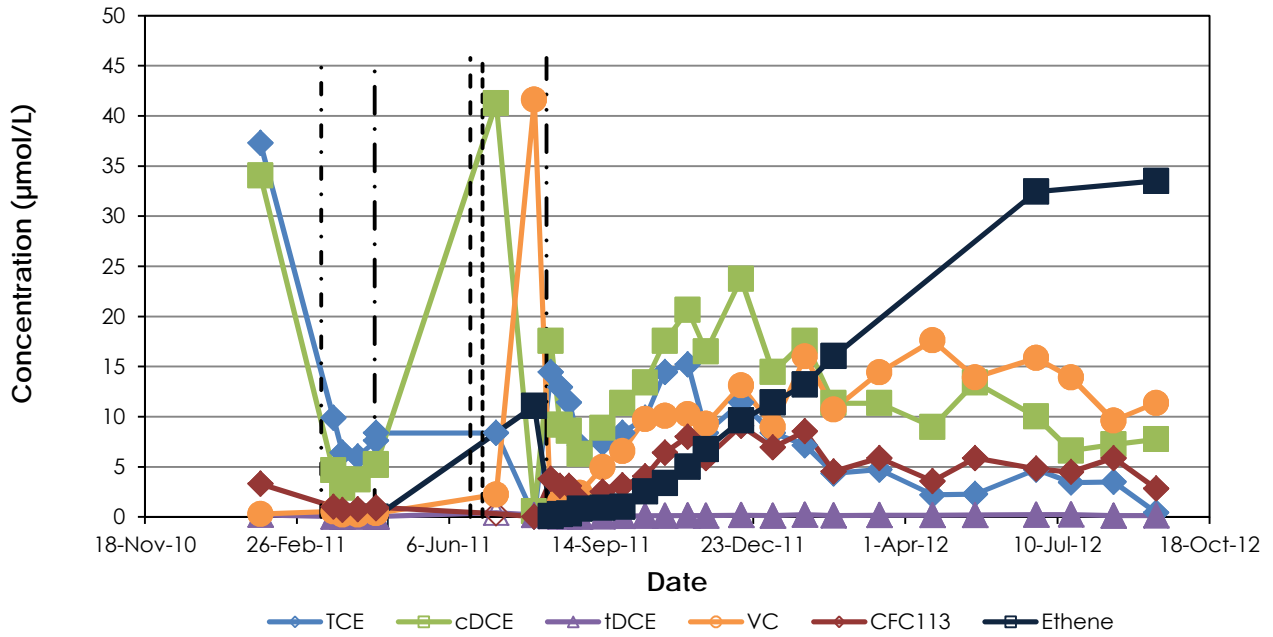
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E-2-23b

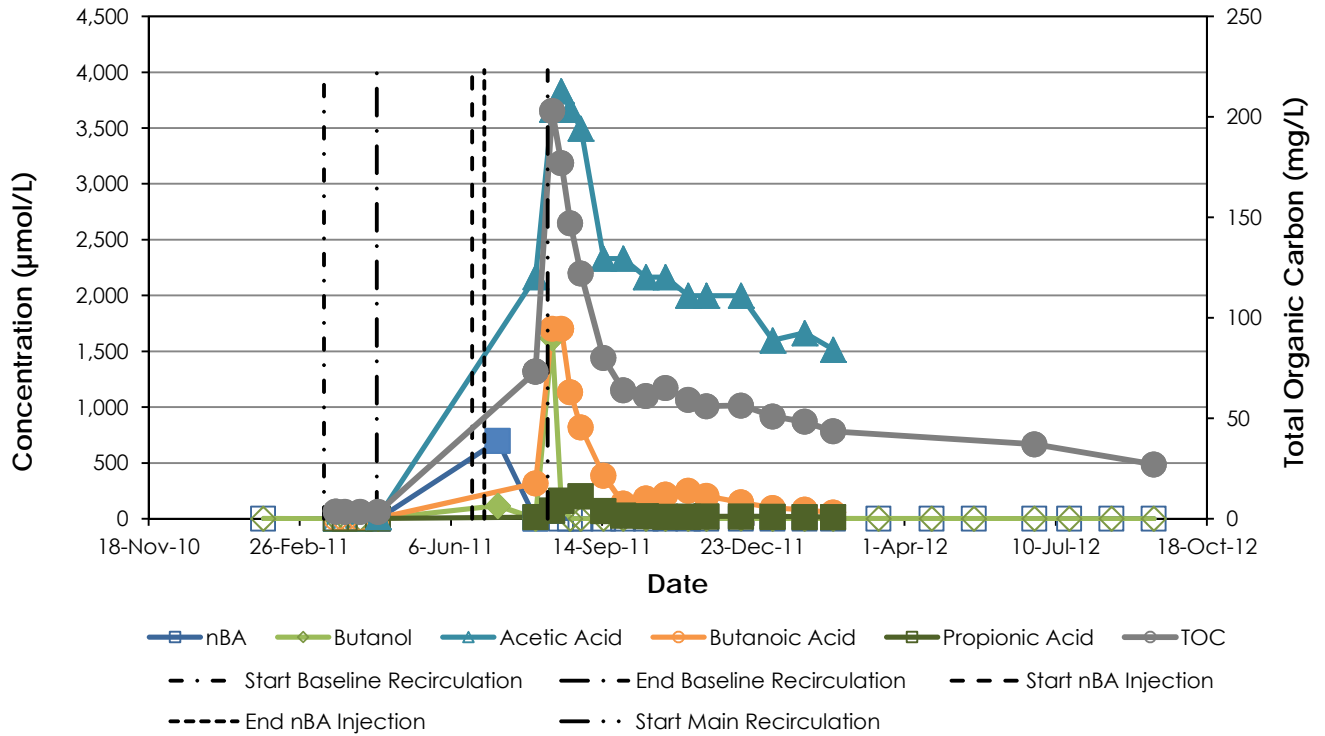
Guelph

May 2014

A) Volatile Organic Compounds



B) Donors and Volatile Fatty Acids



Notes:

µmol/L - micromoles per liter
 mg/L - milligrams per liter
 cDCE - cis-1,2-Dichloroethene
 CFC113 - 1,1,2-Trichloro-1,2,2-trifluoroethane
 nBA - n-Butyl acetate
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 TOC - Total Organic Carbon
 VC - Vinyl chloride
 Hollow symbols represent non-detects presented at the method detection limit.

RW0008 - Volatile Organic Compound, Donor and Volatile Fatty Acid Time Trends

Launch Complex 34, Cape Canaveral, FL



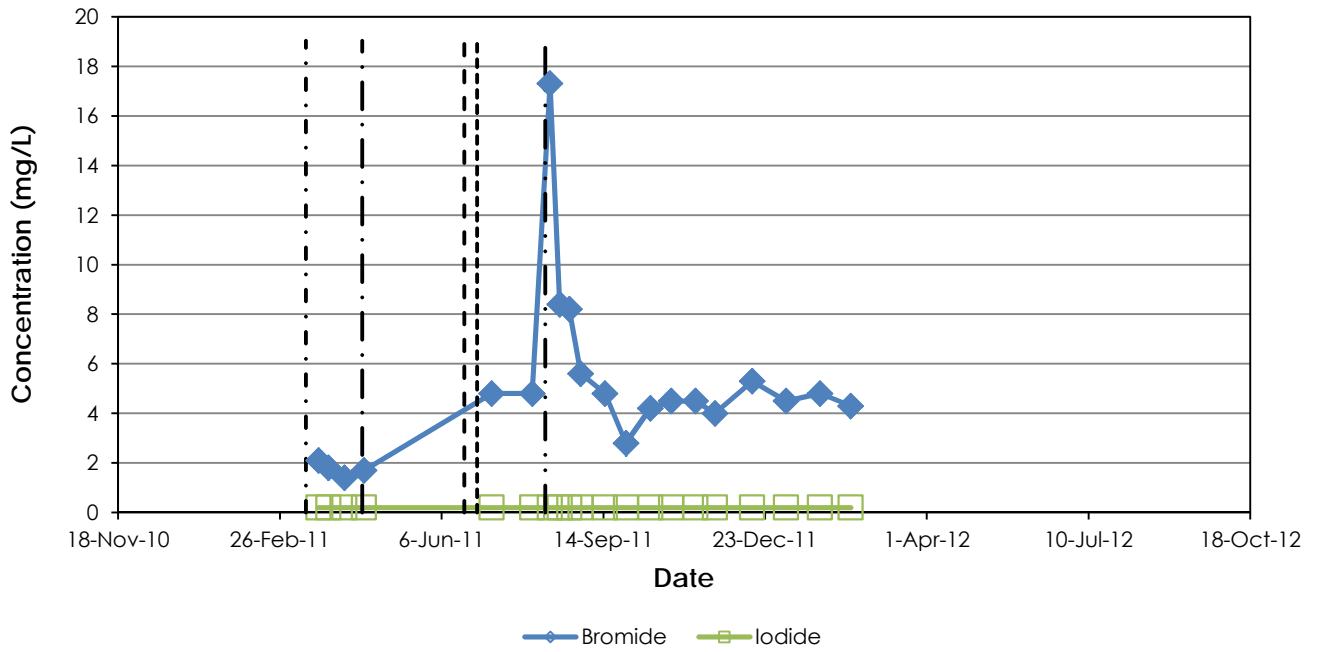
Figure

E-2-24a

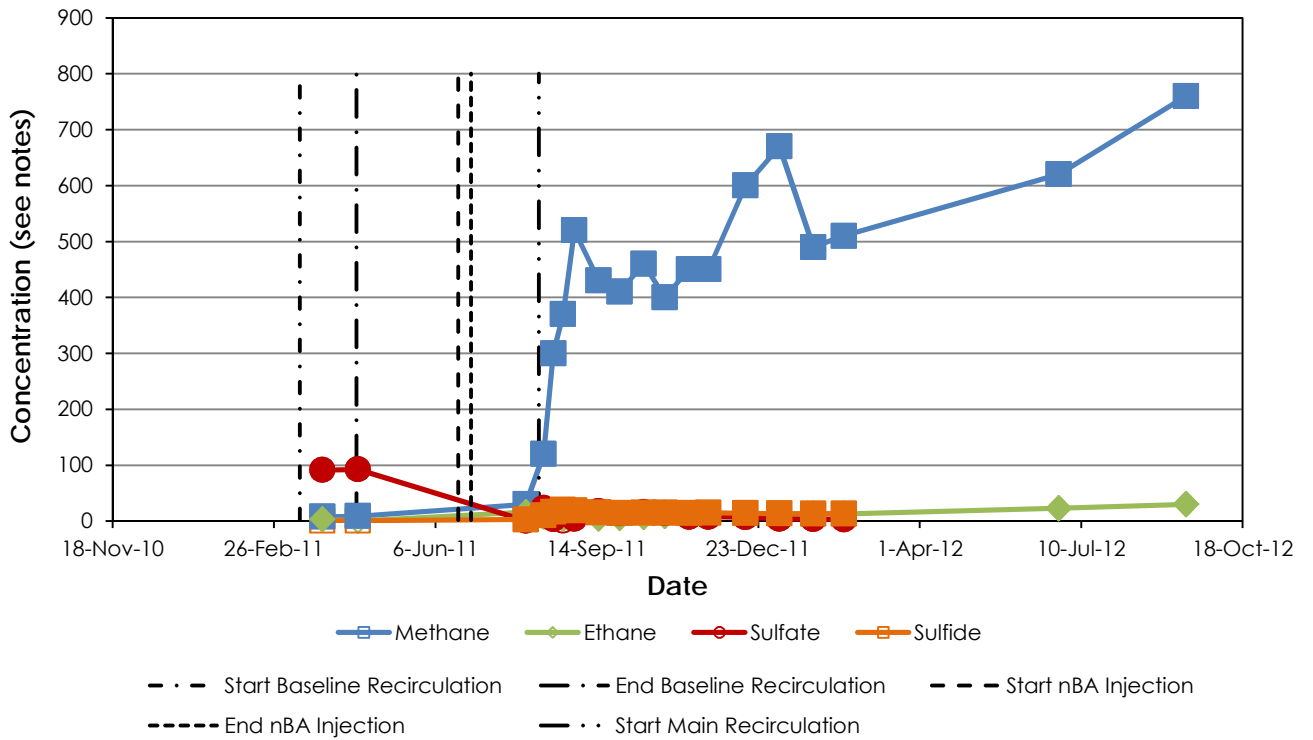
Guelph

May 2014

C) Tracers



D) Geochemical Parameters



Notes:
 mg/L - milligrams per liter
 µg/L - micrograms per liter
 Methane and Ethane in µg/L
 Sulfate and Sulfide in mg/L.
 Hollow symbols represent non-detects presented at the method detection limit.

RW0008 - Tracer and Geochemical Parameter Time Trends

Launch Complex 34, Cape Canaveral, FL



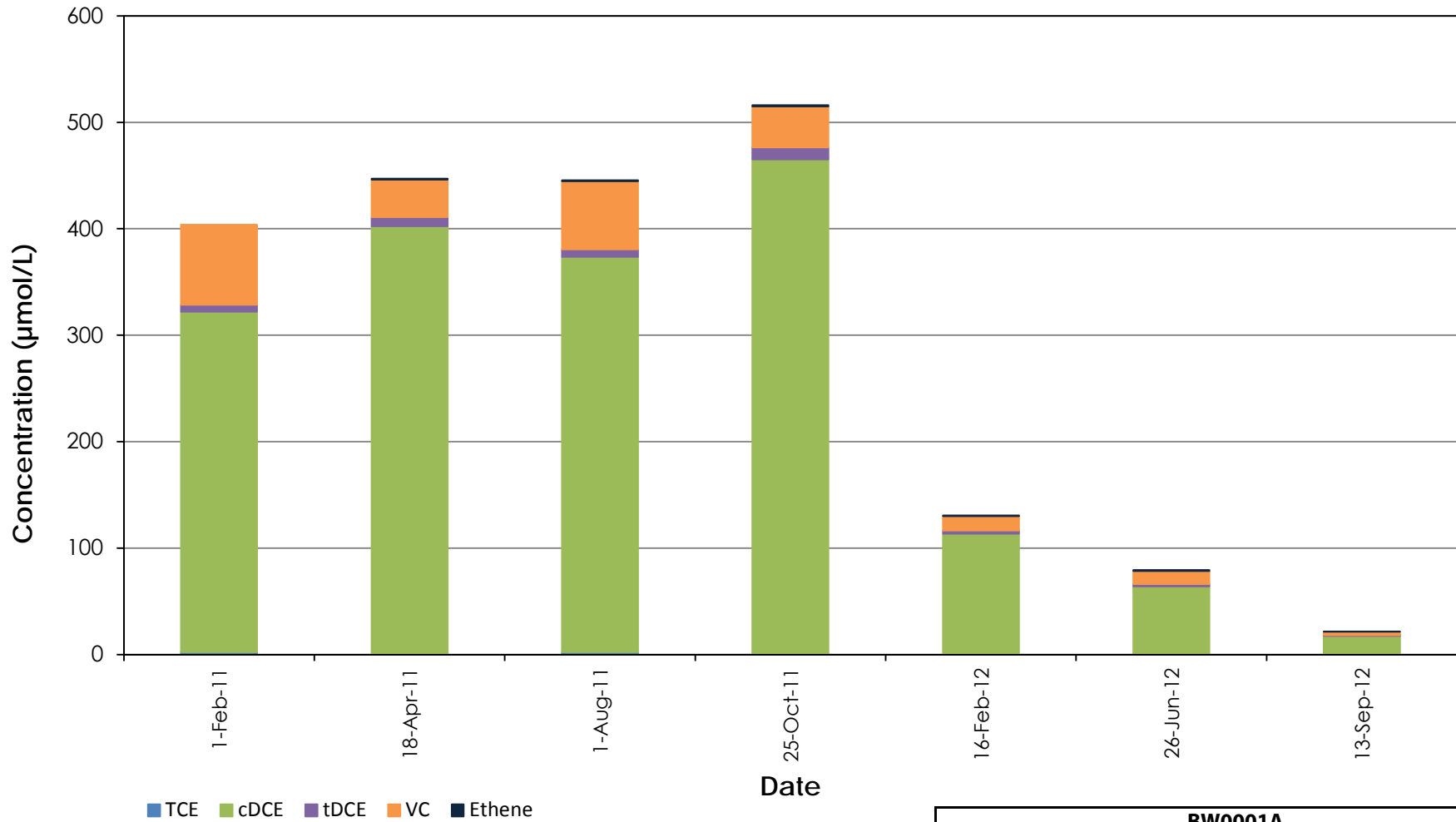
Figure

E-2-24b


Guelph

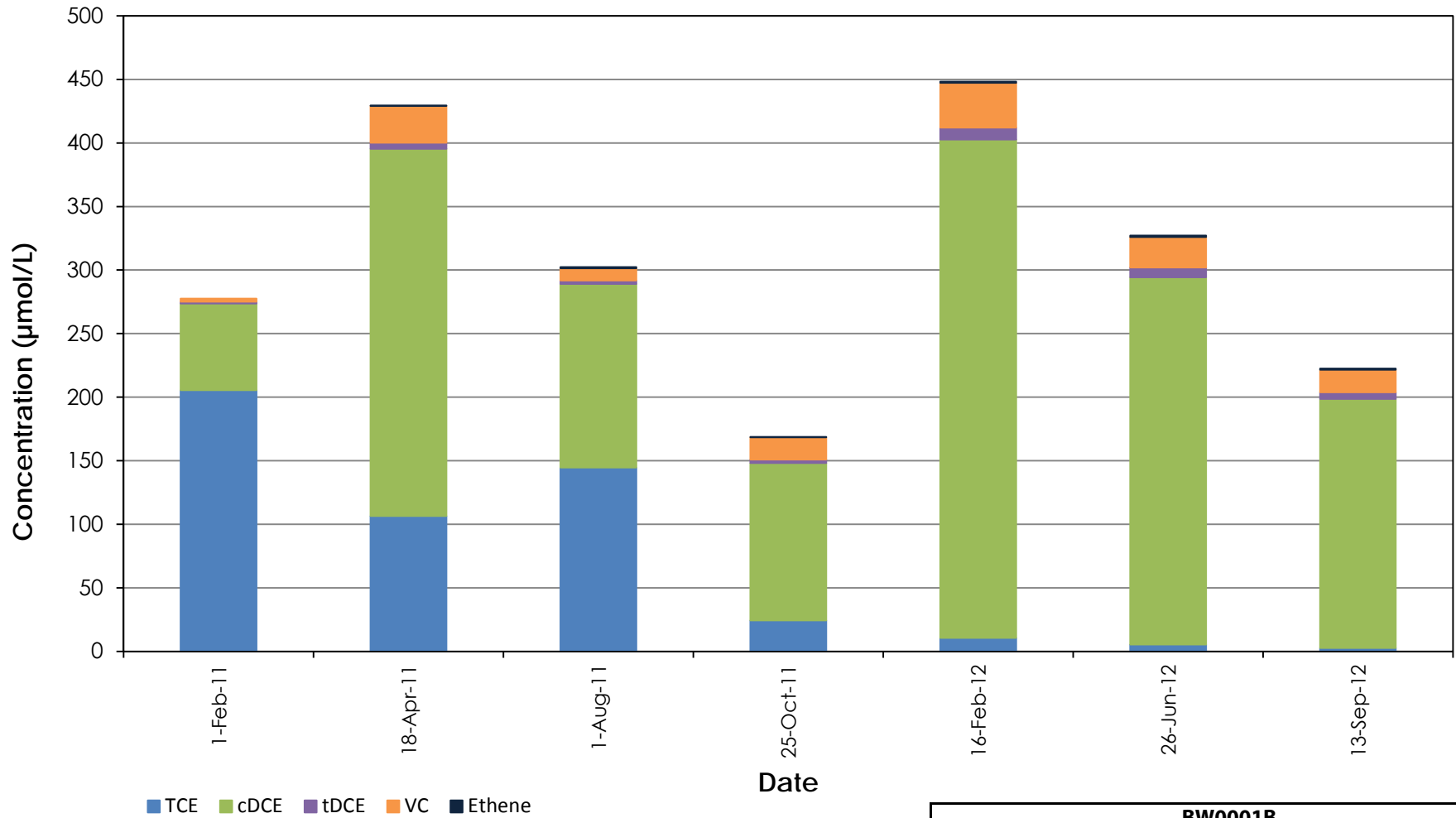
May 2014

ATTACHMENT E-3
DISTRIBUTION OF VOCS BY WELL (STACKED BAR CHARTS)



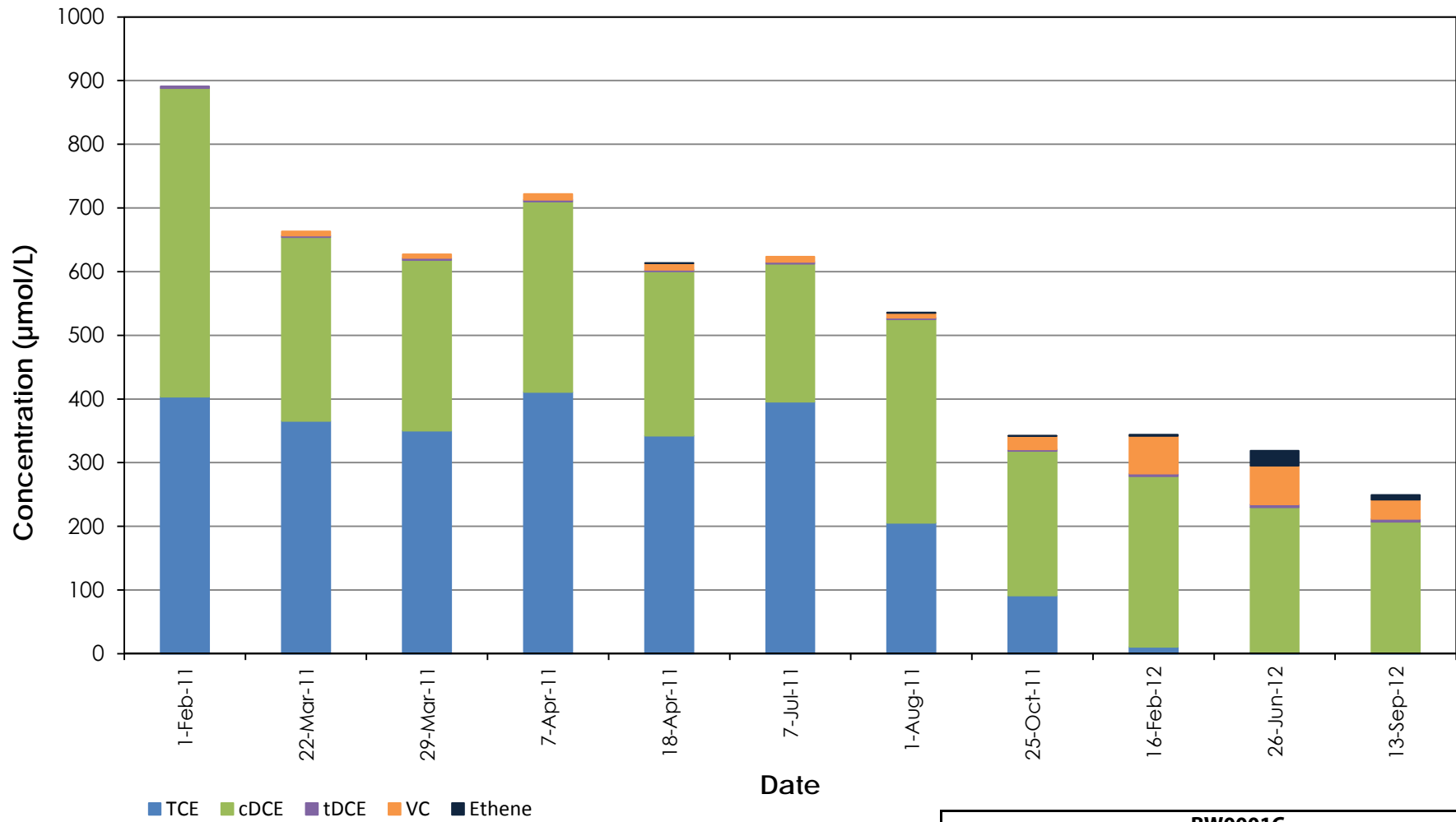
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW001A Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
Appendix E	



Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

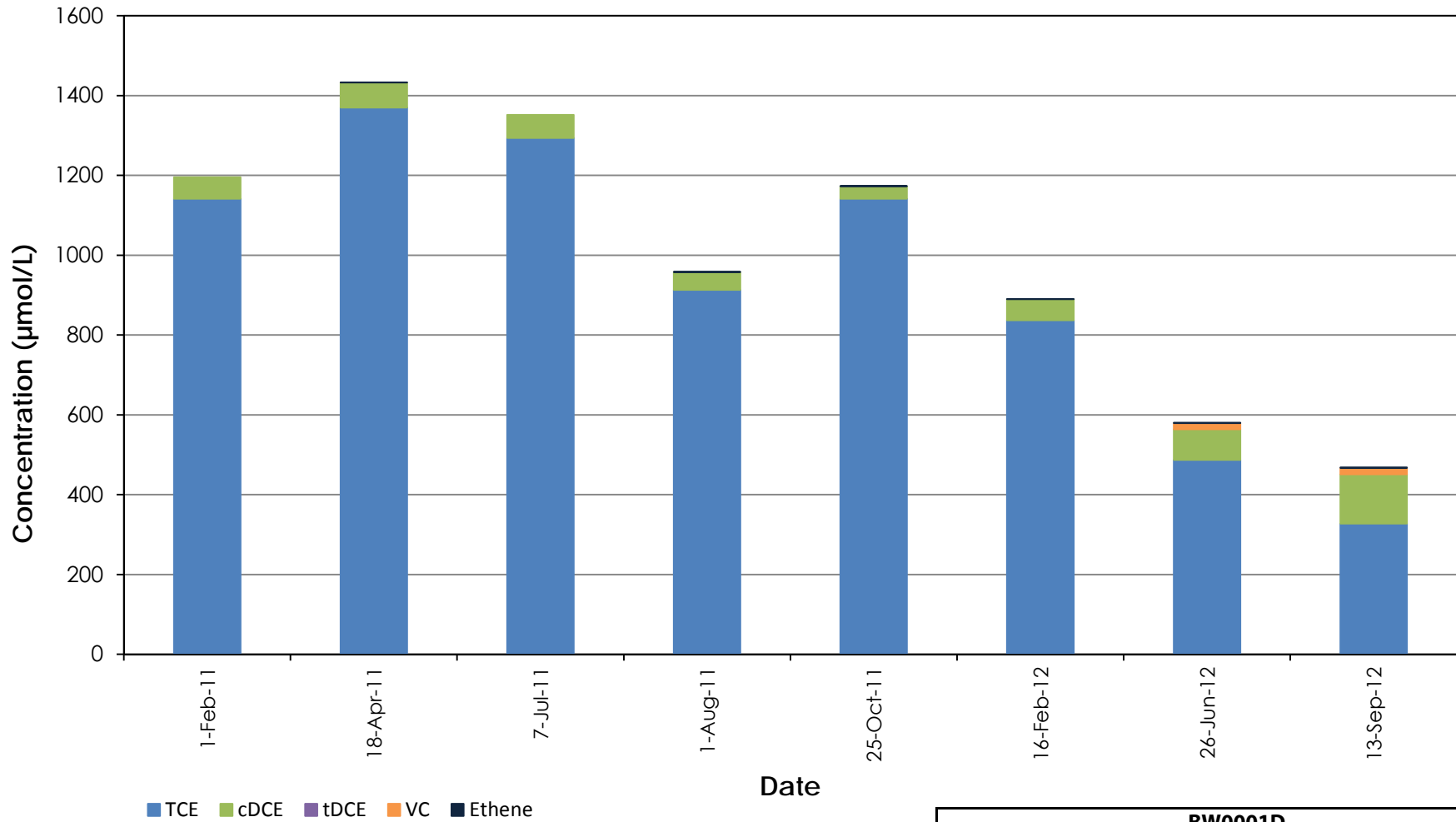
BW0001B Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Appendix E	



Notes:

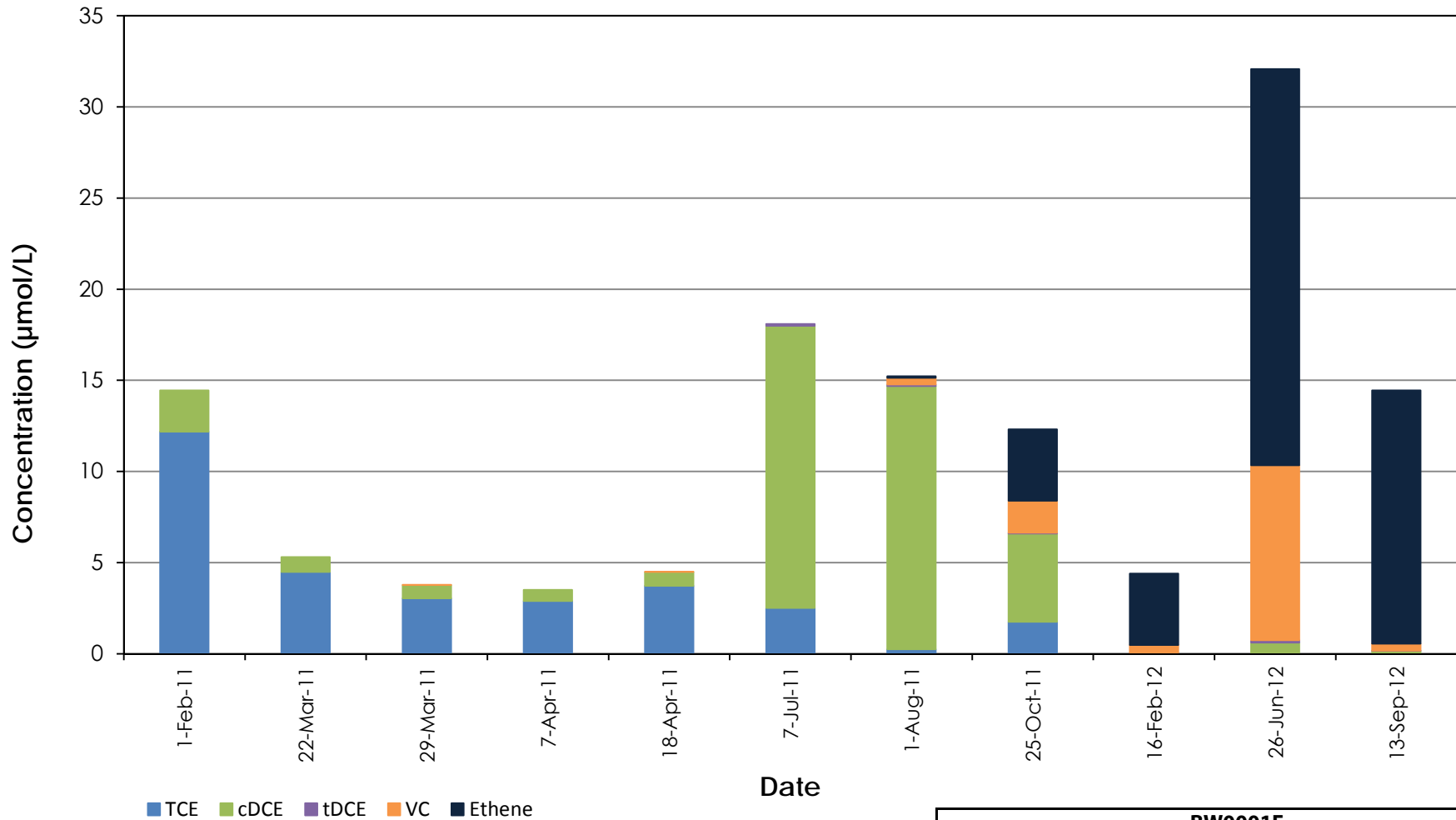
Bars represent detected data only
 µmol/L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW001C Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Appendix E	



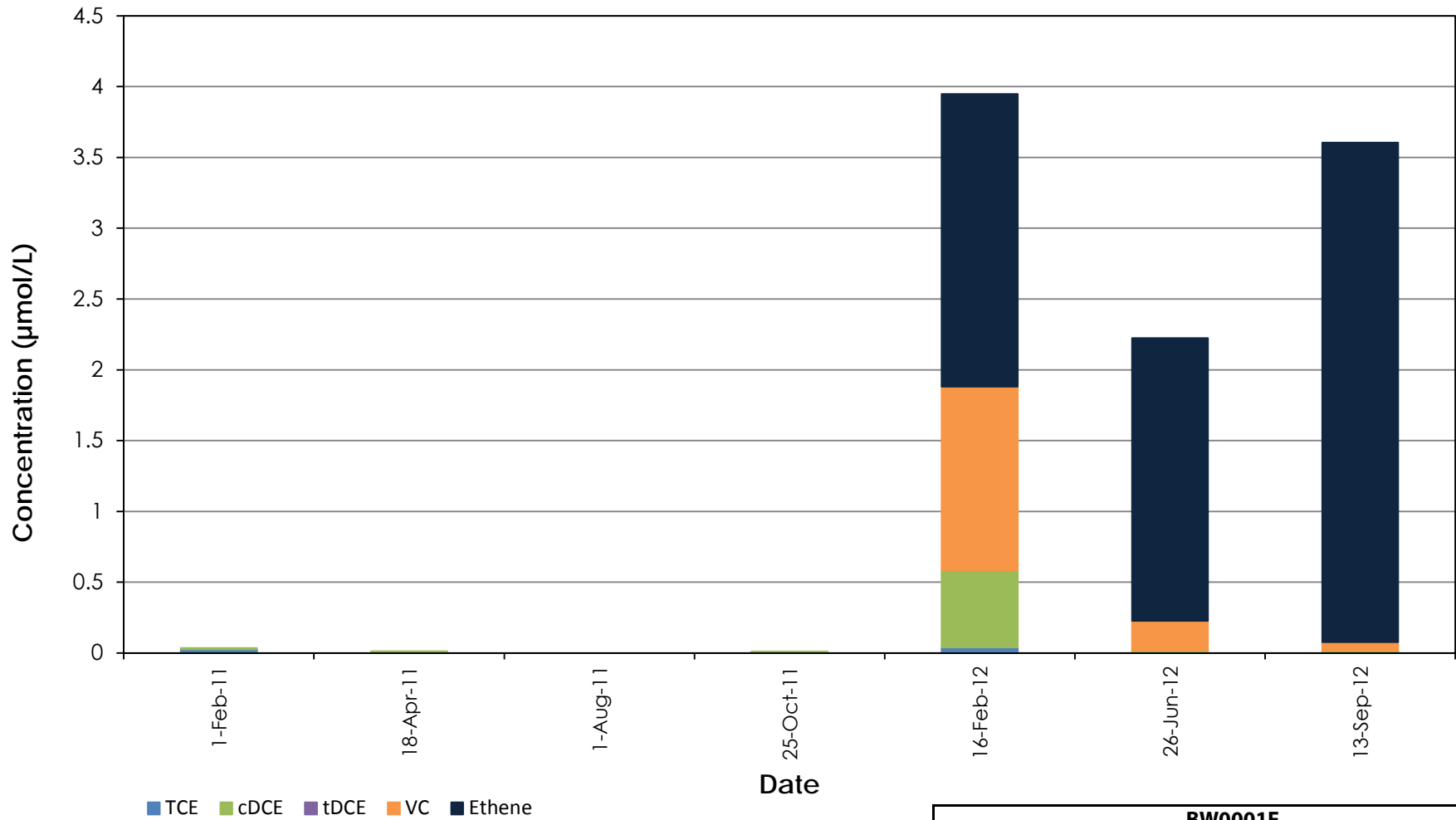
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0001D Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Appendix E	




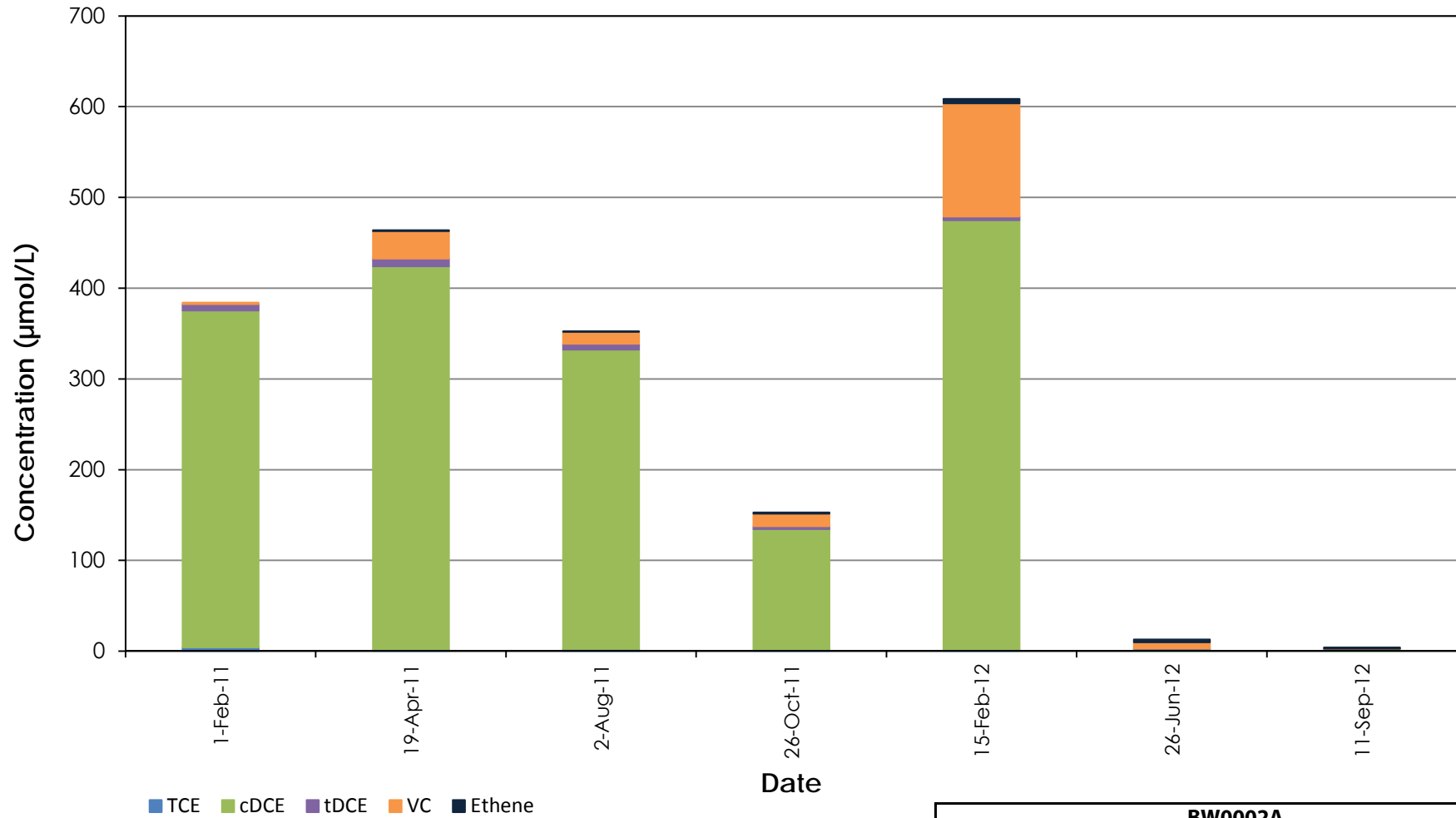
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW001E Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Appendix E	



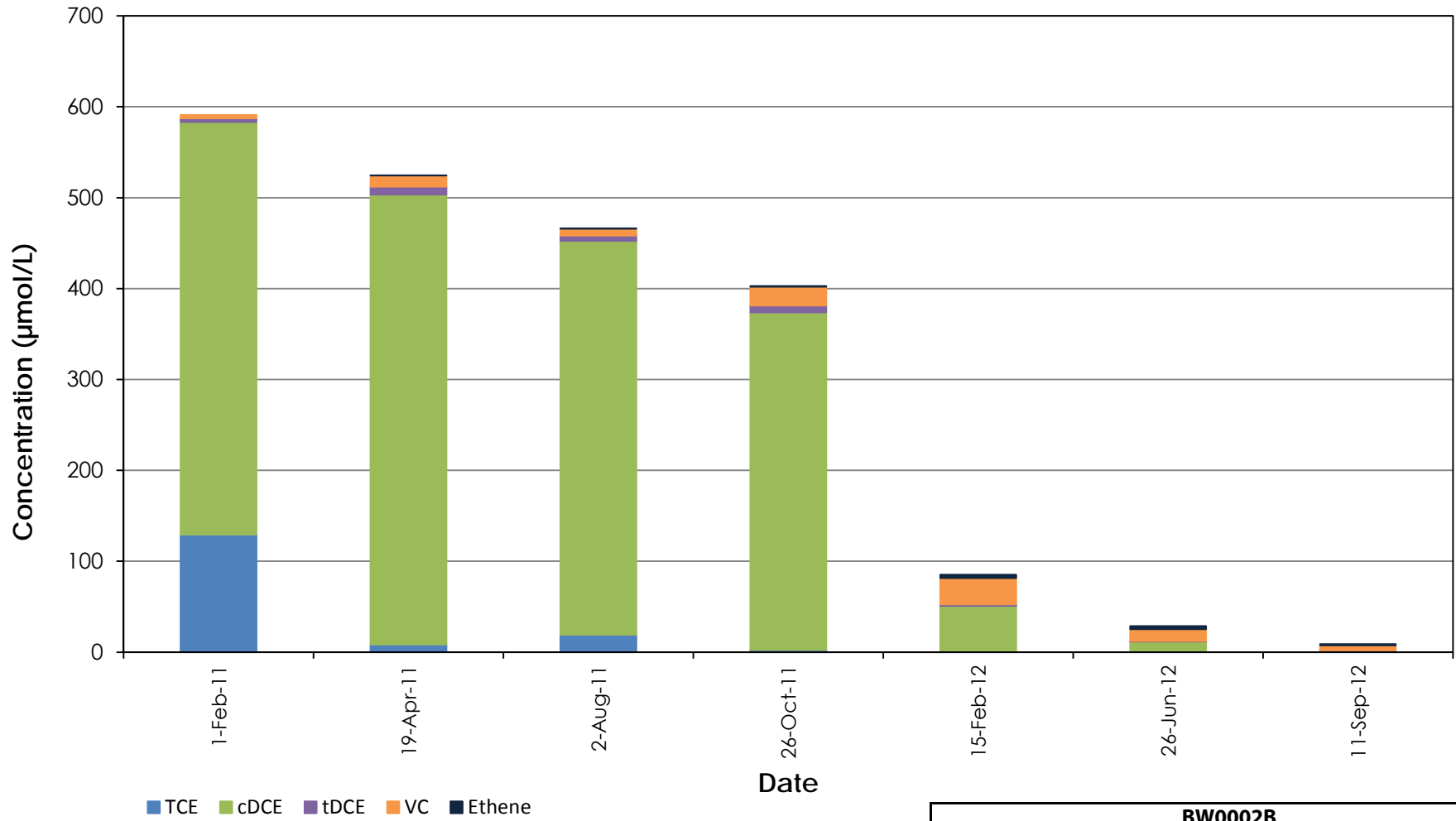
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0001F Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
Appendix E	




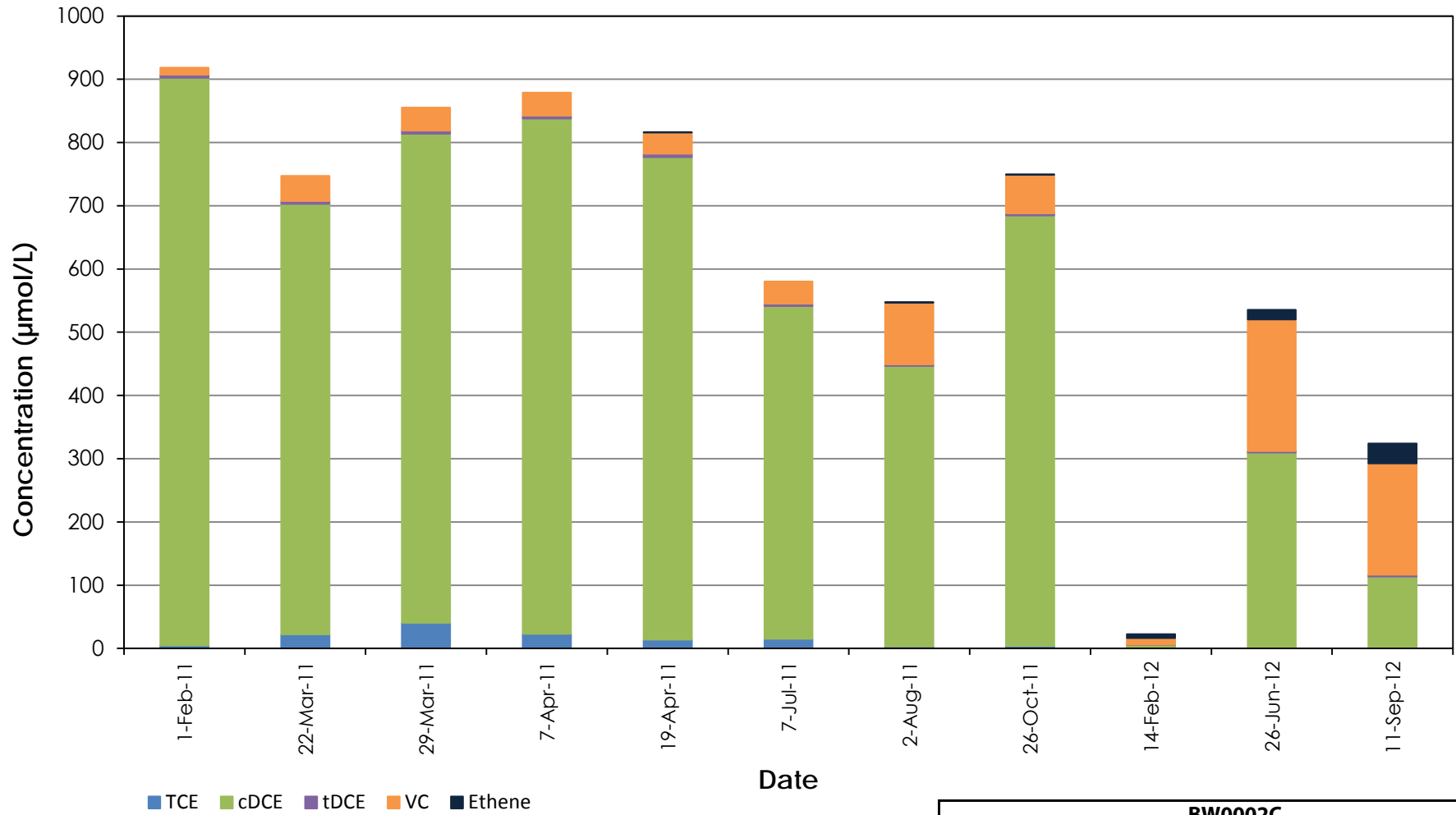
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0002A Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
Appendix E	




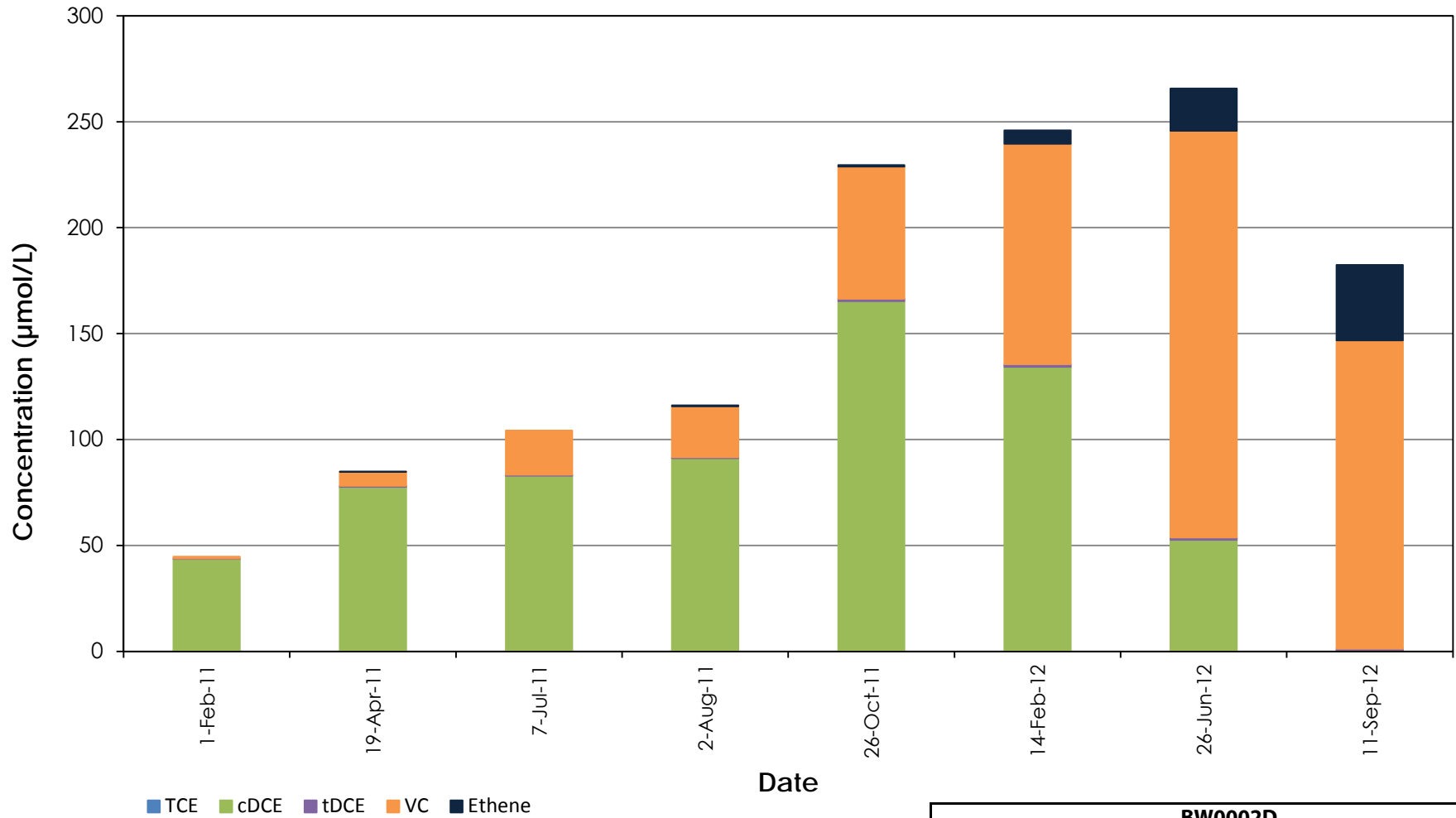
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0002B Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
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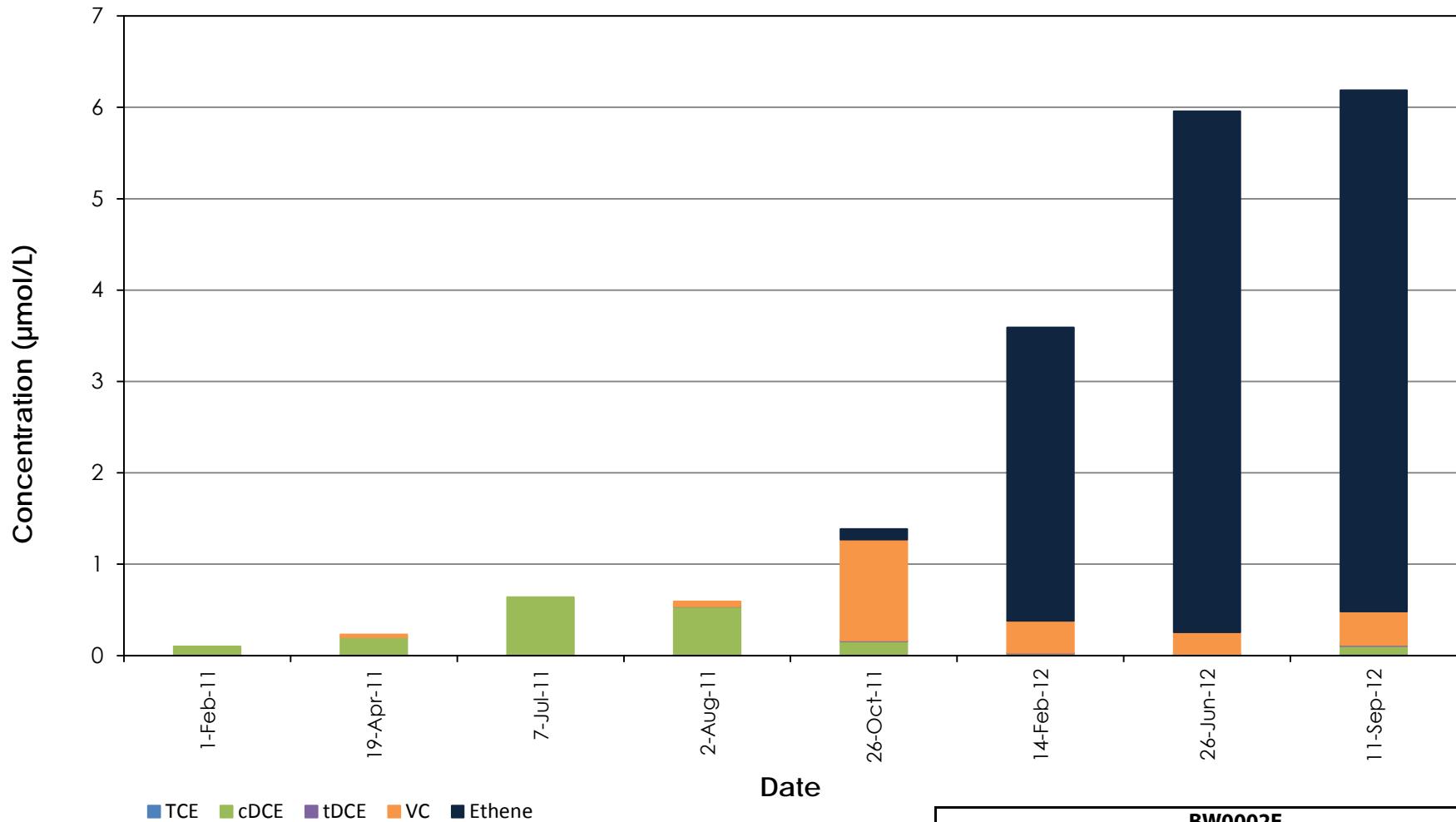
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 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0002C Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
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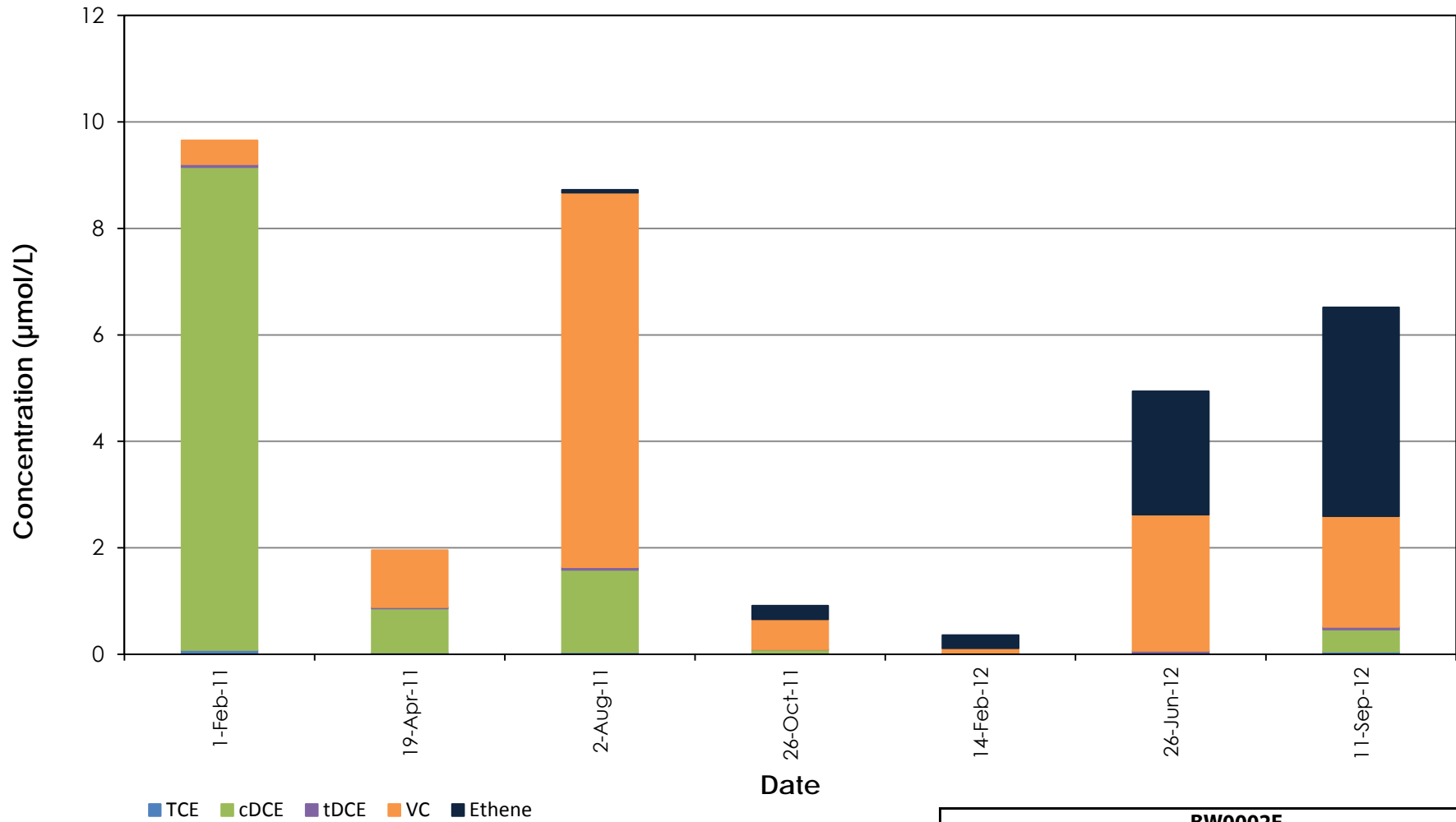
Notes:
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 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0002D Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

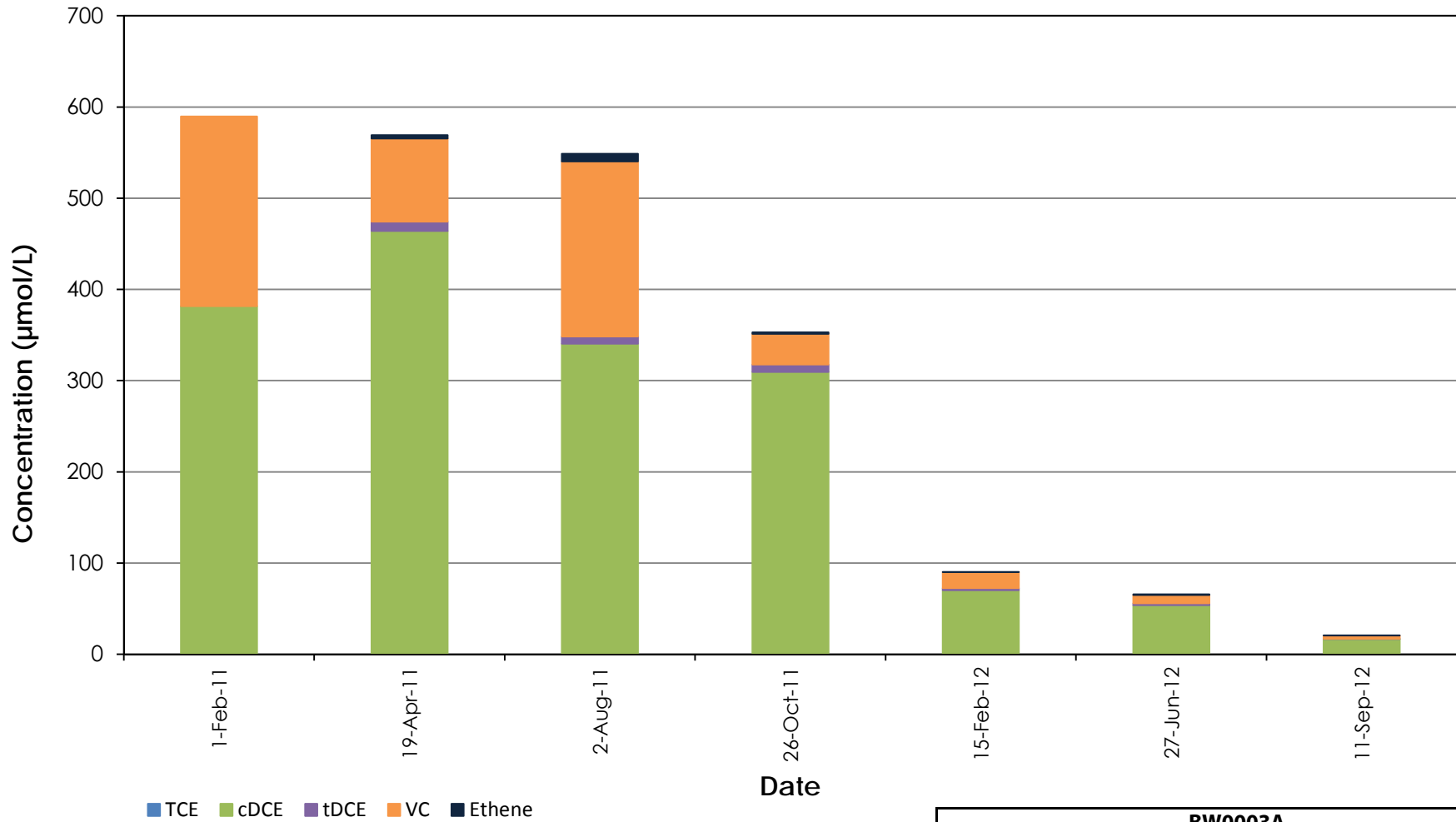
BW0002E Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
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Notes:

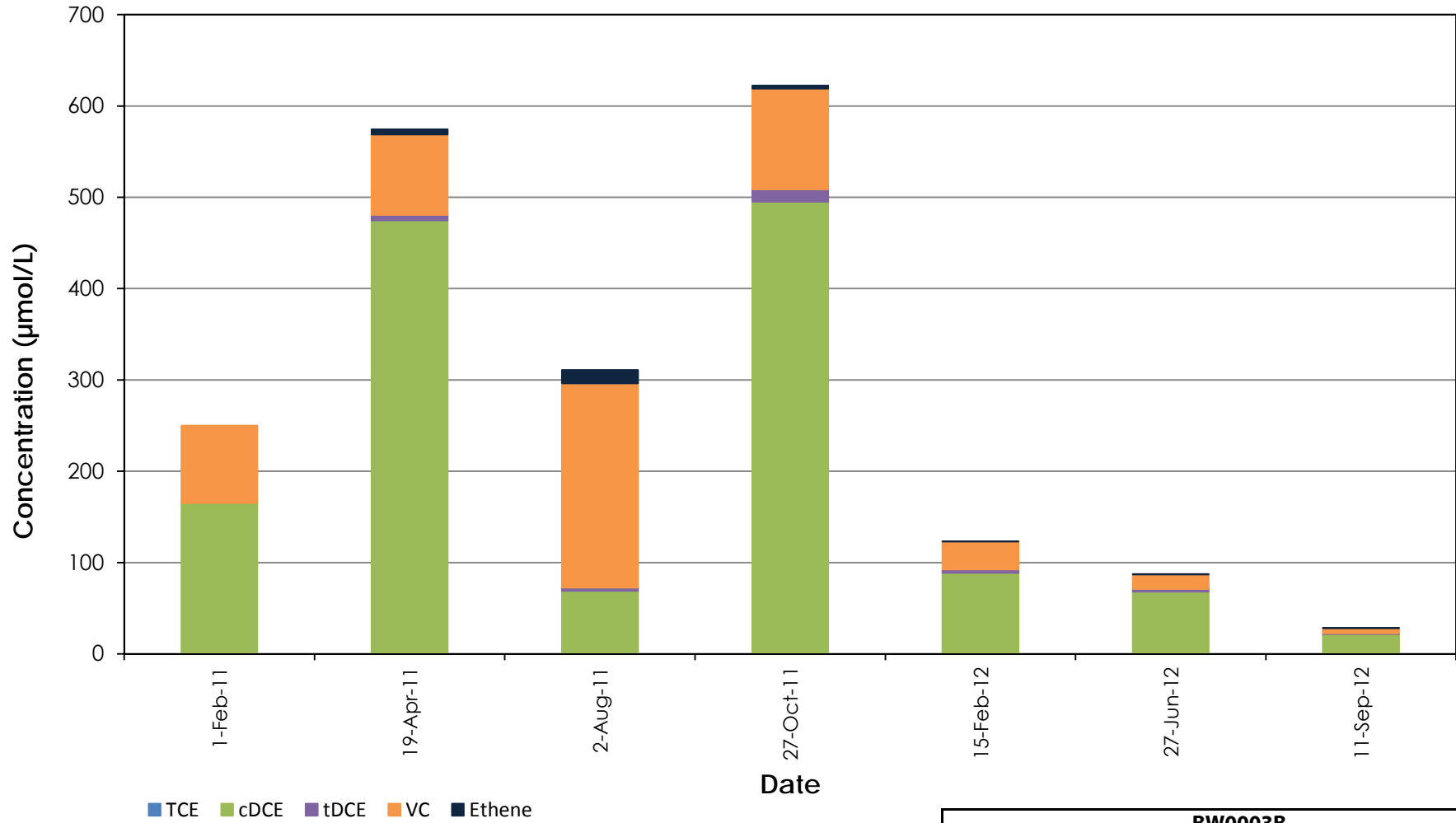
Bars represent detected data only
 µmol/ L - micromoles per liter
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 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0002F Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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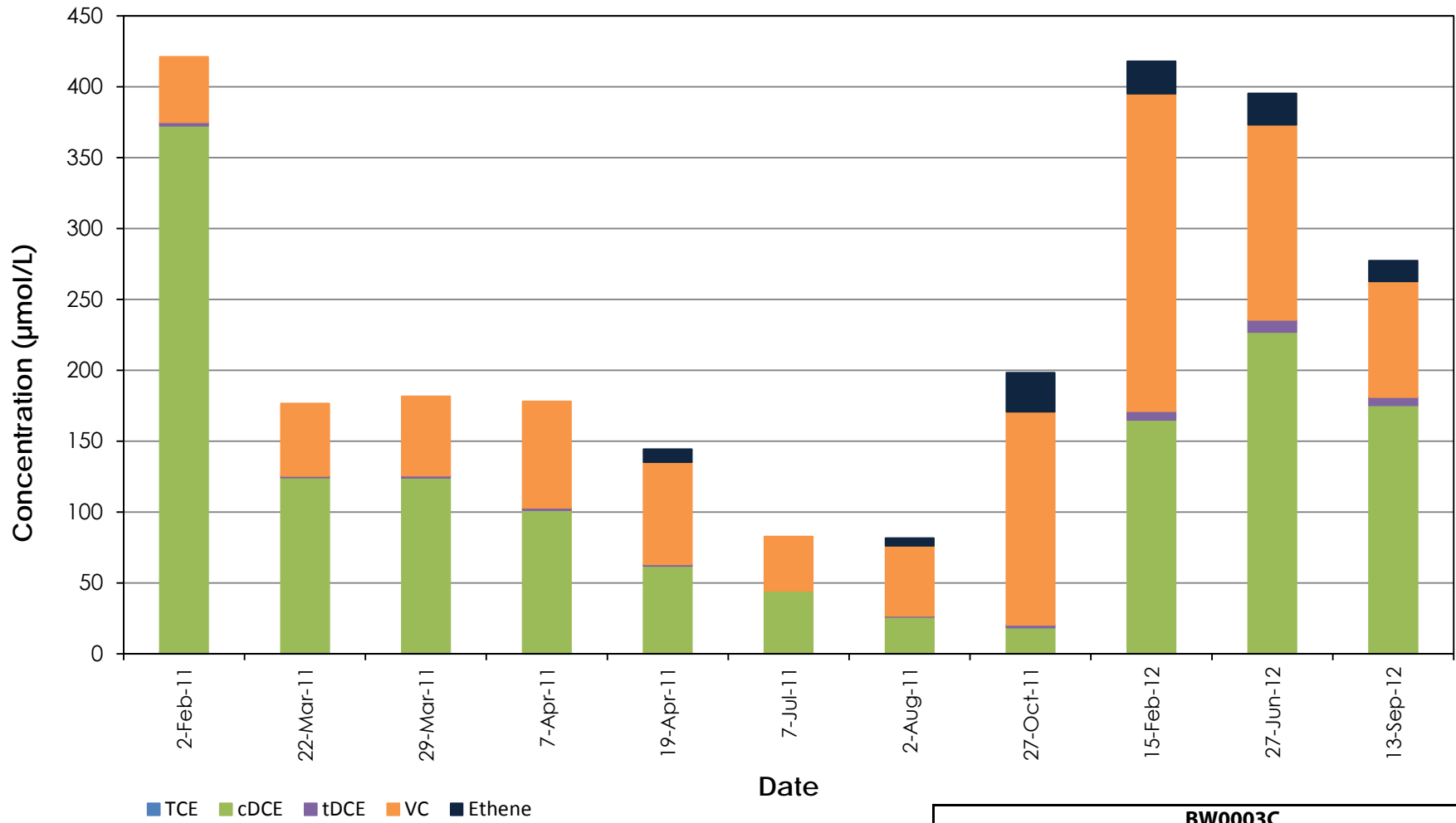
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 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW003A Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
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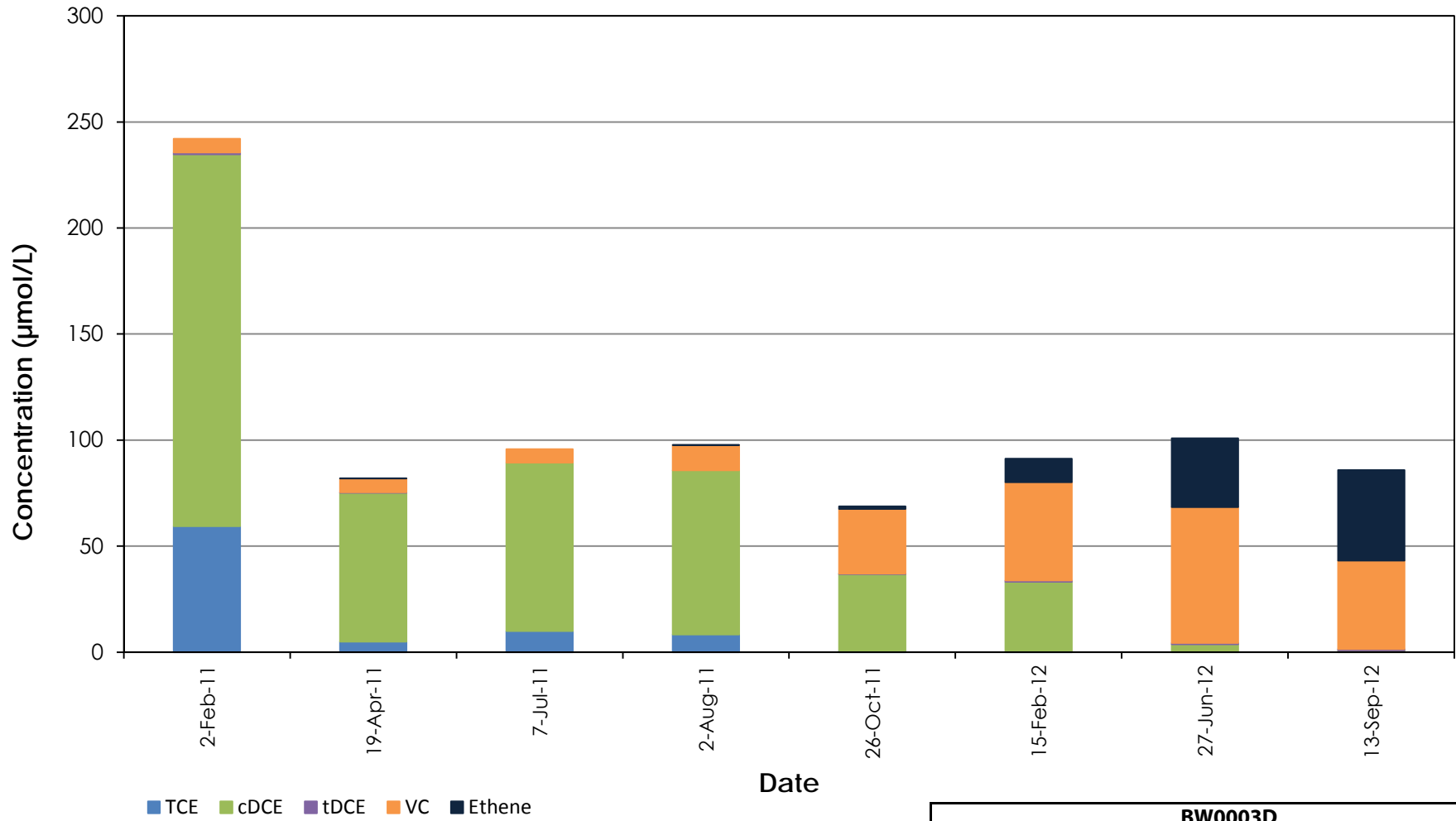
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 TCE - Trichloroethene
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 VC - Vinyl chloride

BW0003B Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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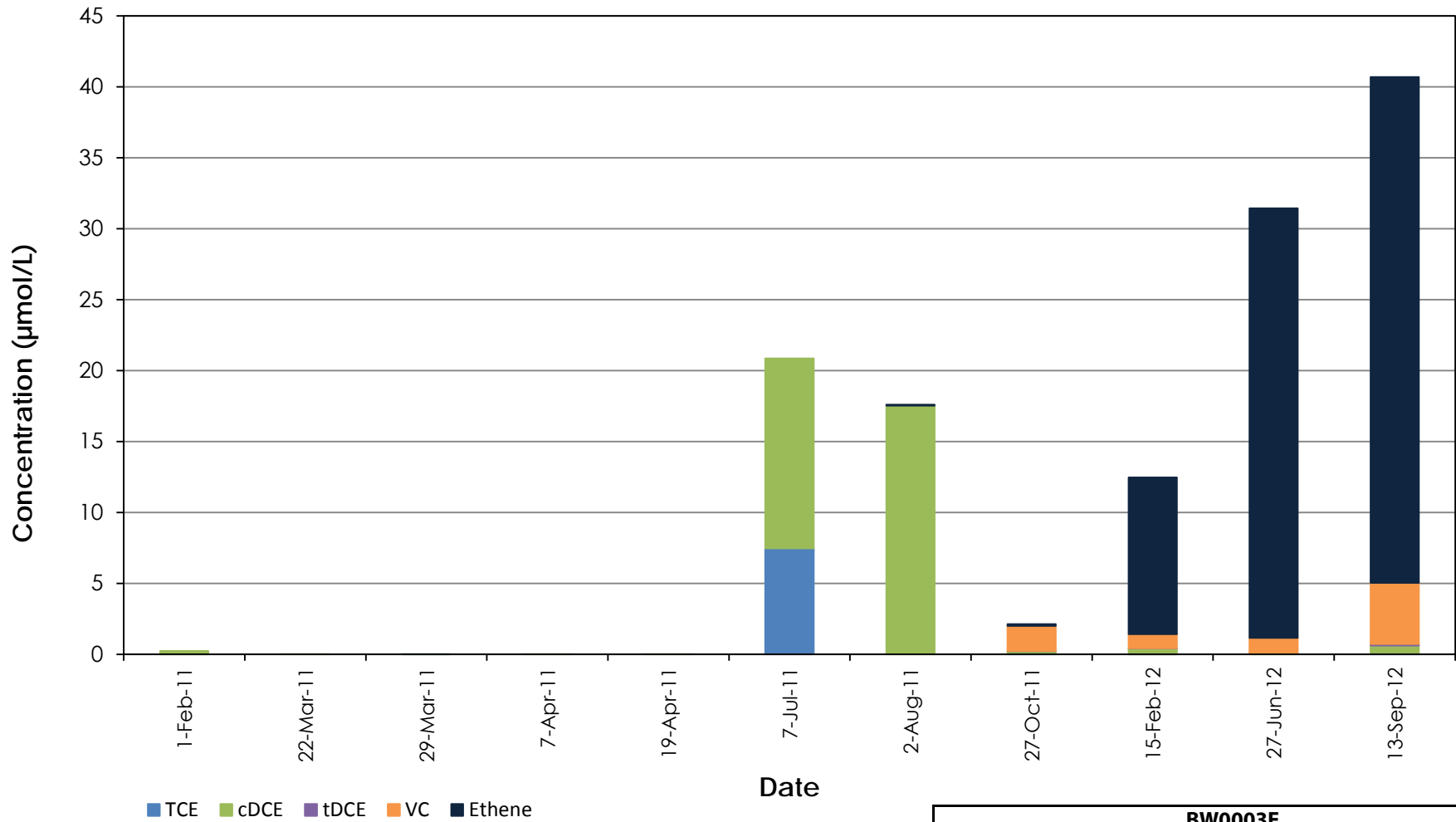
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 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0003C Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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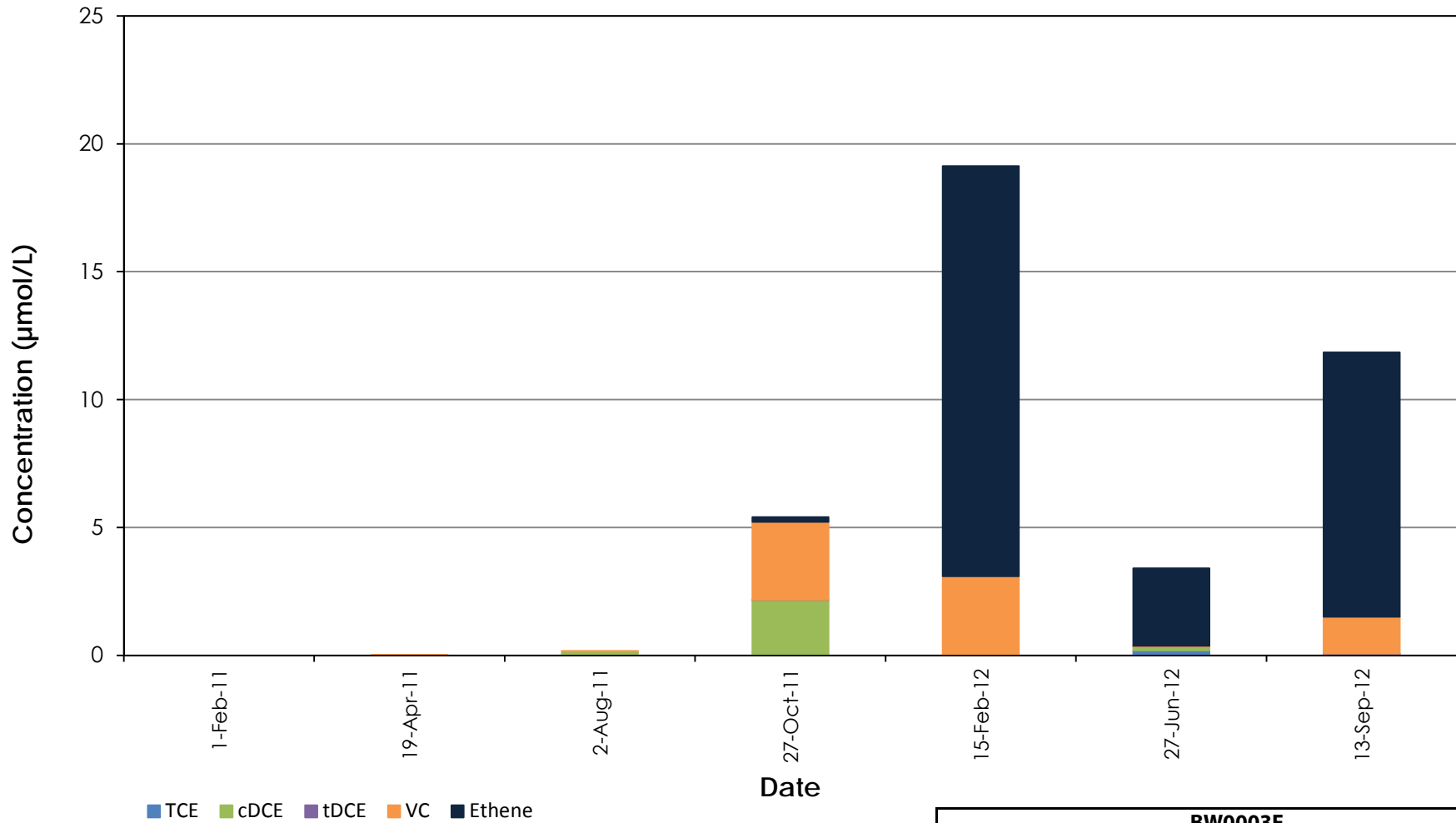
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 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0003D Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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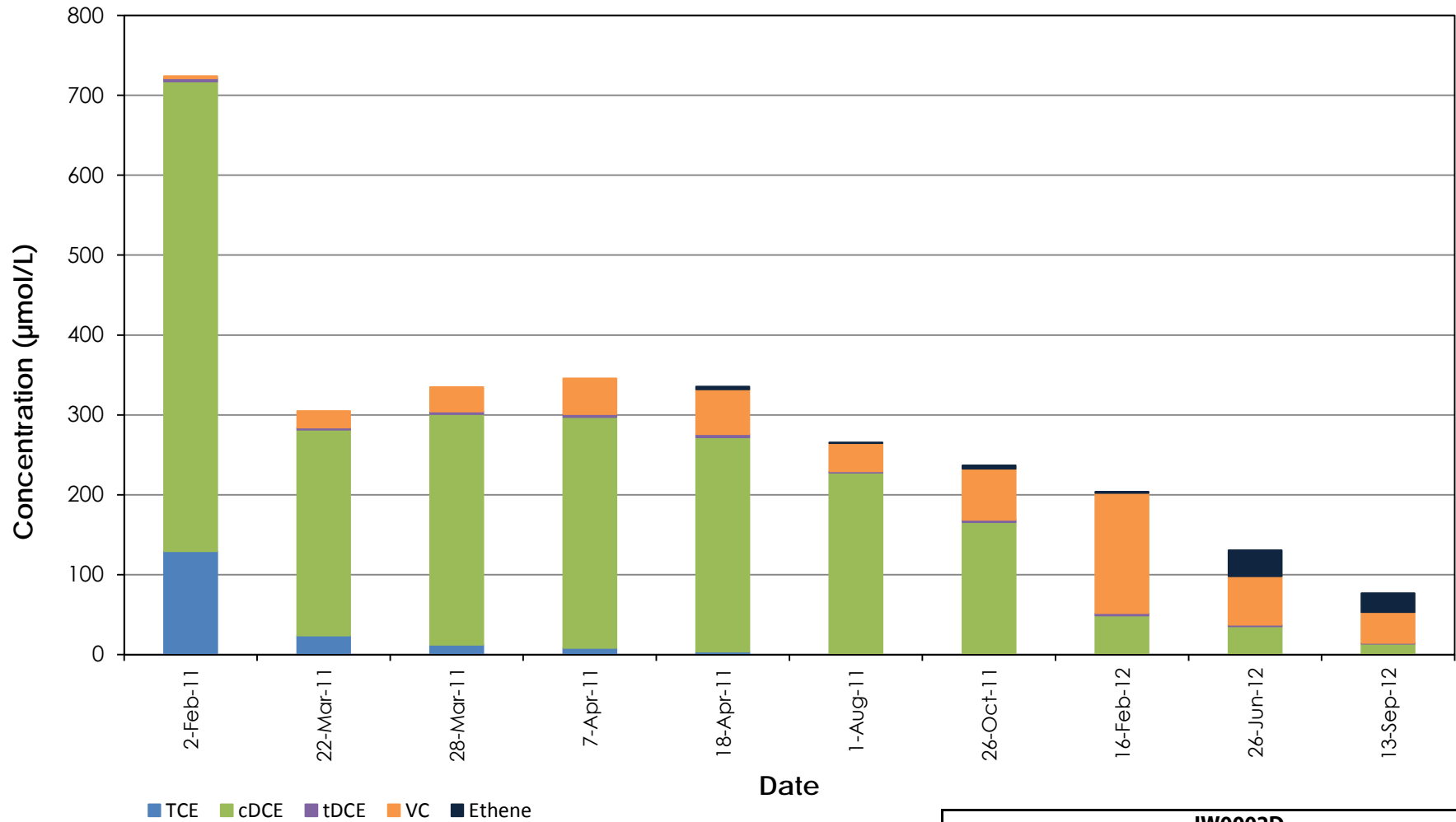
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 µmol/ L - micromoles per liter
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 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW0003E Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
	
Guelph	May 2014
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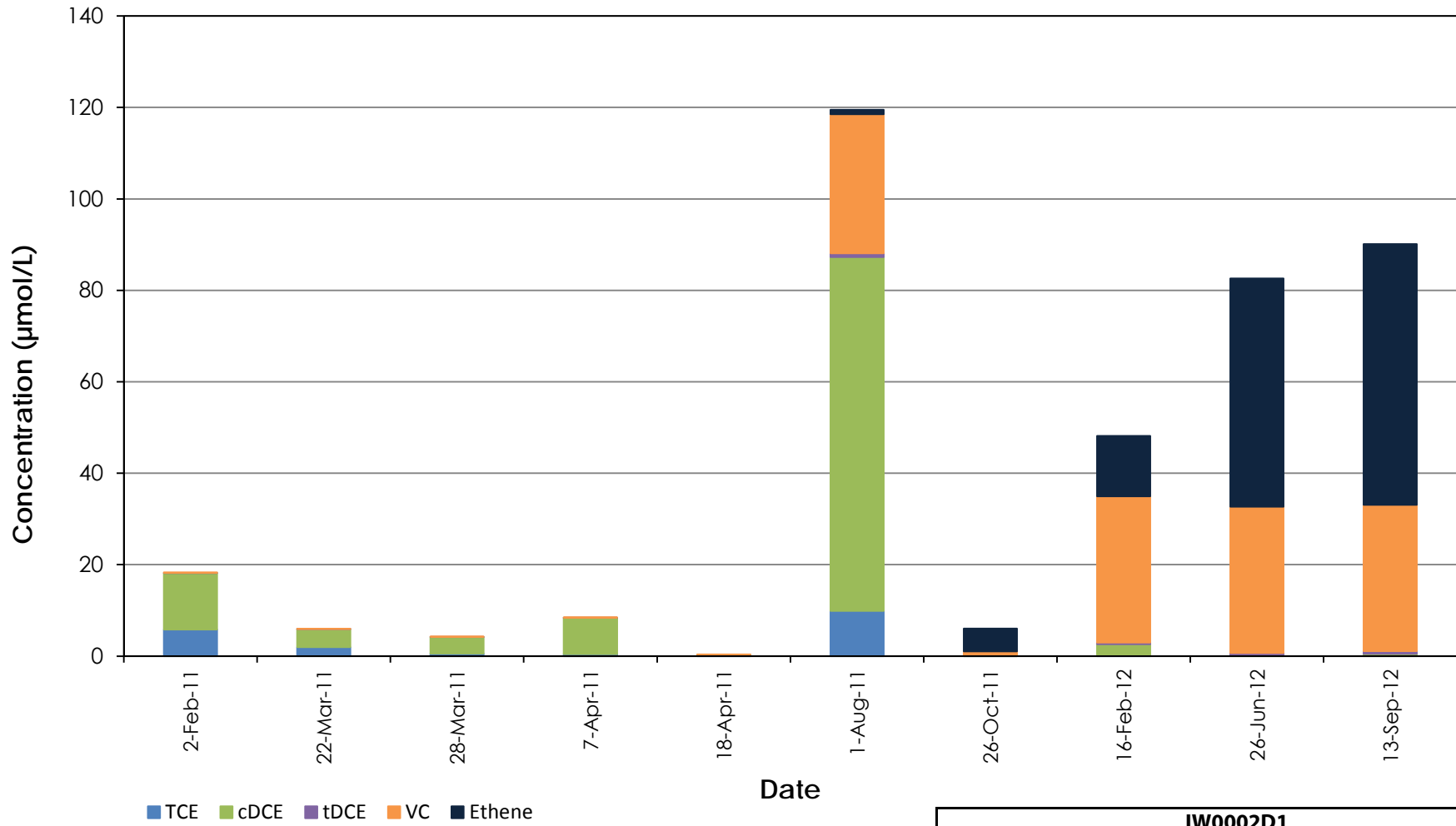
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 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

BW003F Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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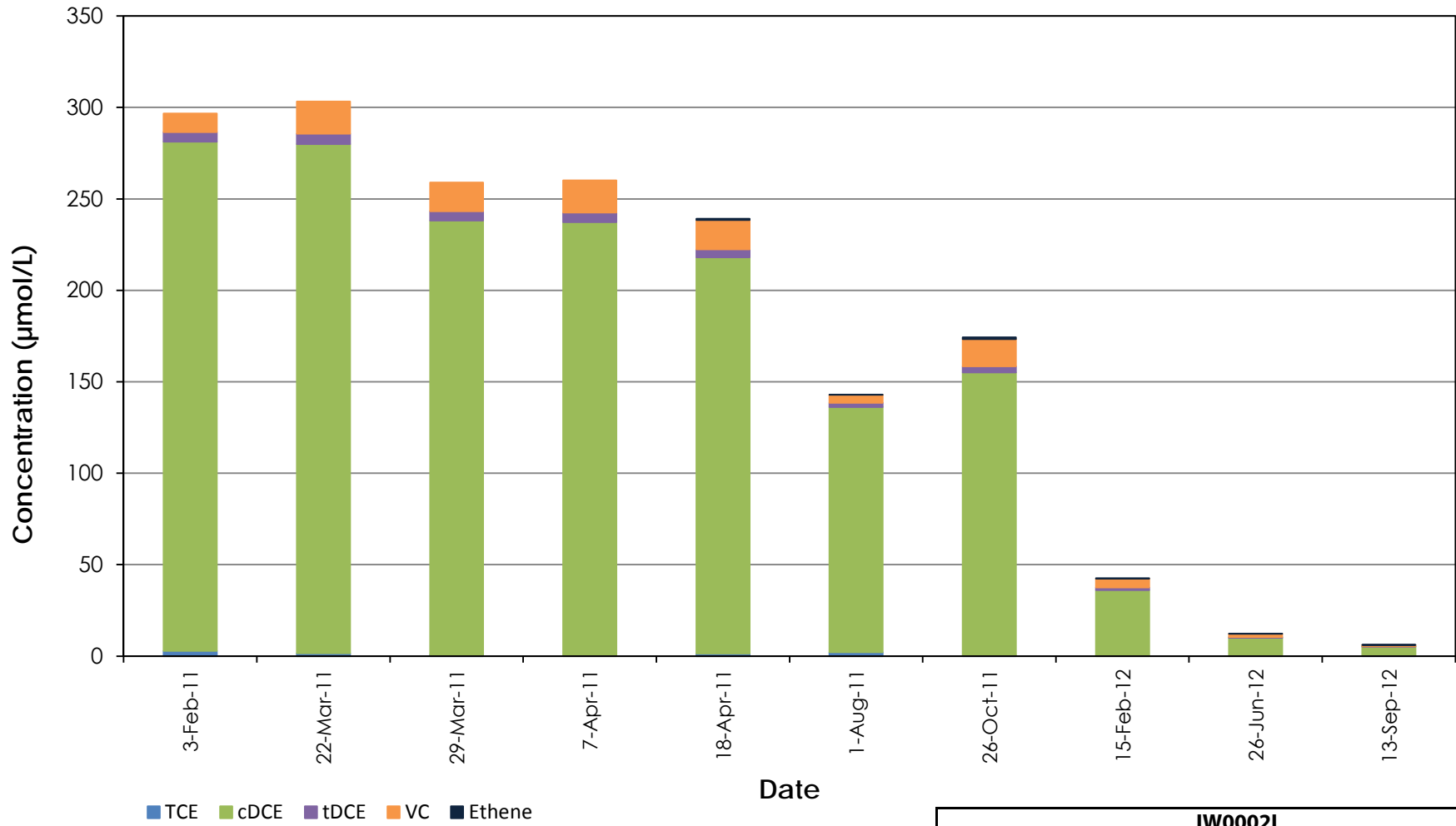
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

IW0002D Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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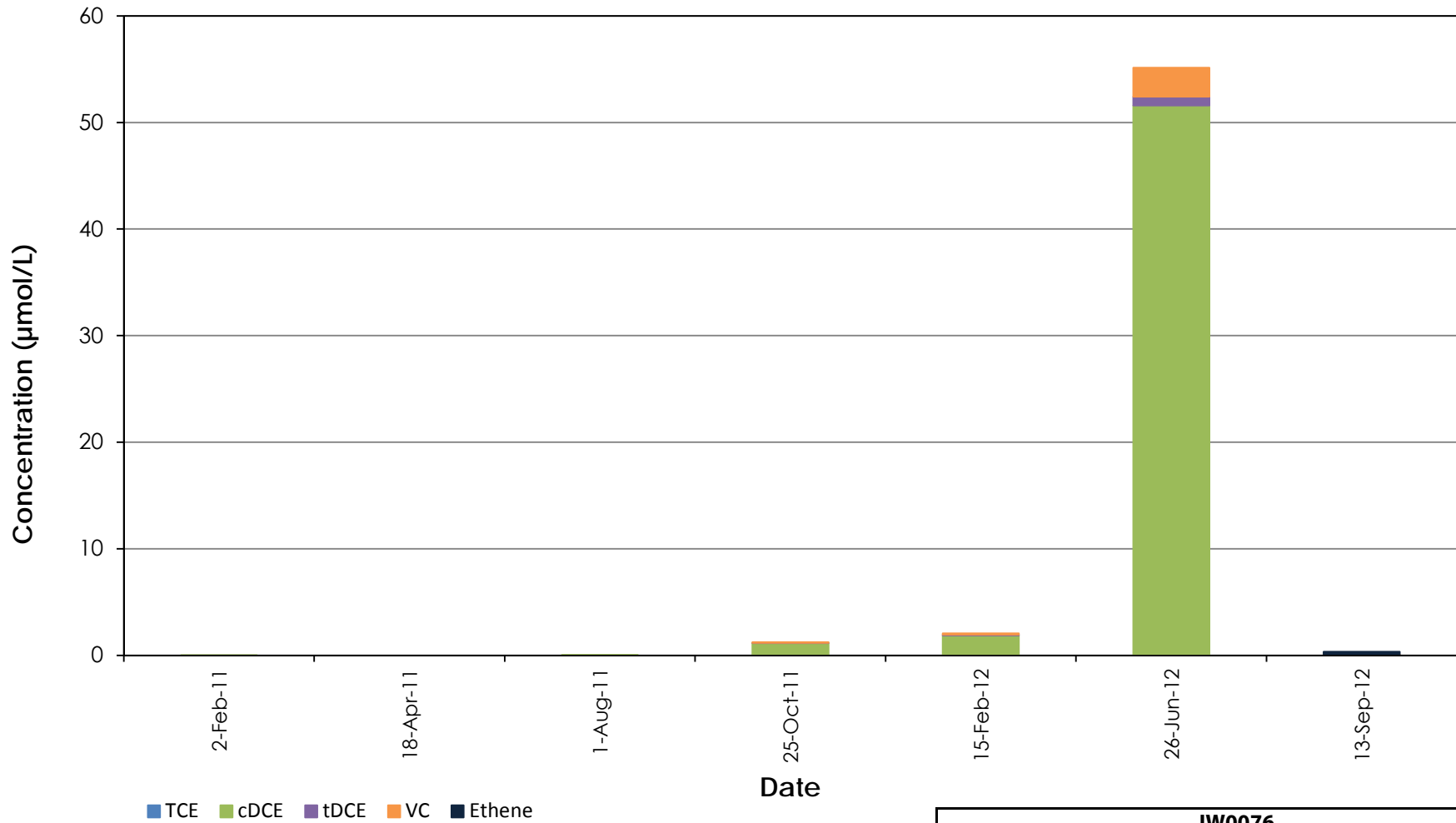
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

IW0002D1 Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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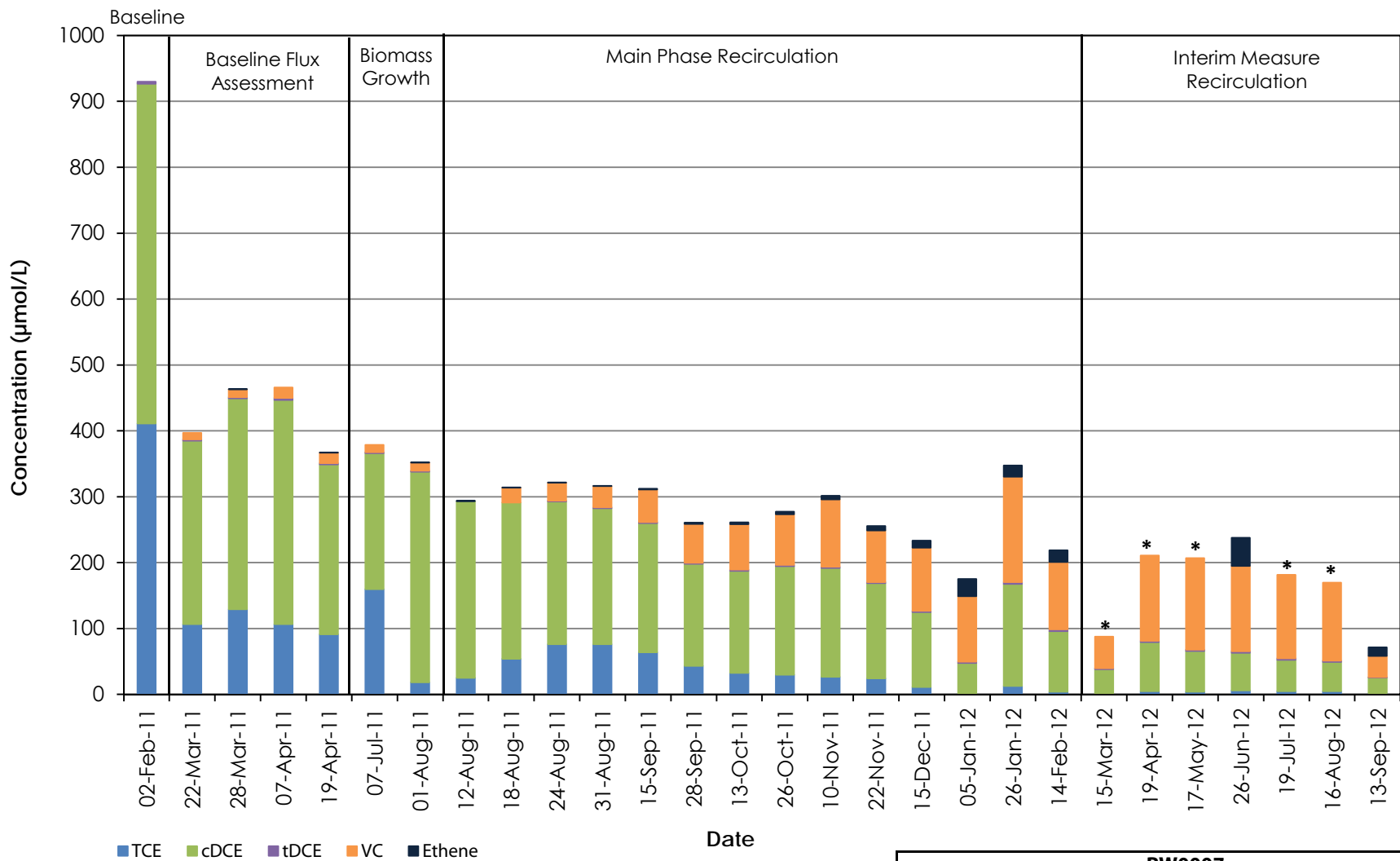
Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

IW00021 Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL		Appendix E
		
Guelph	May 2014	



Notes:
 Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride

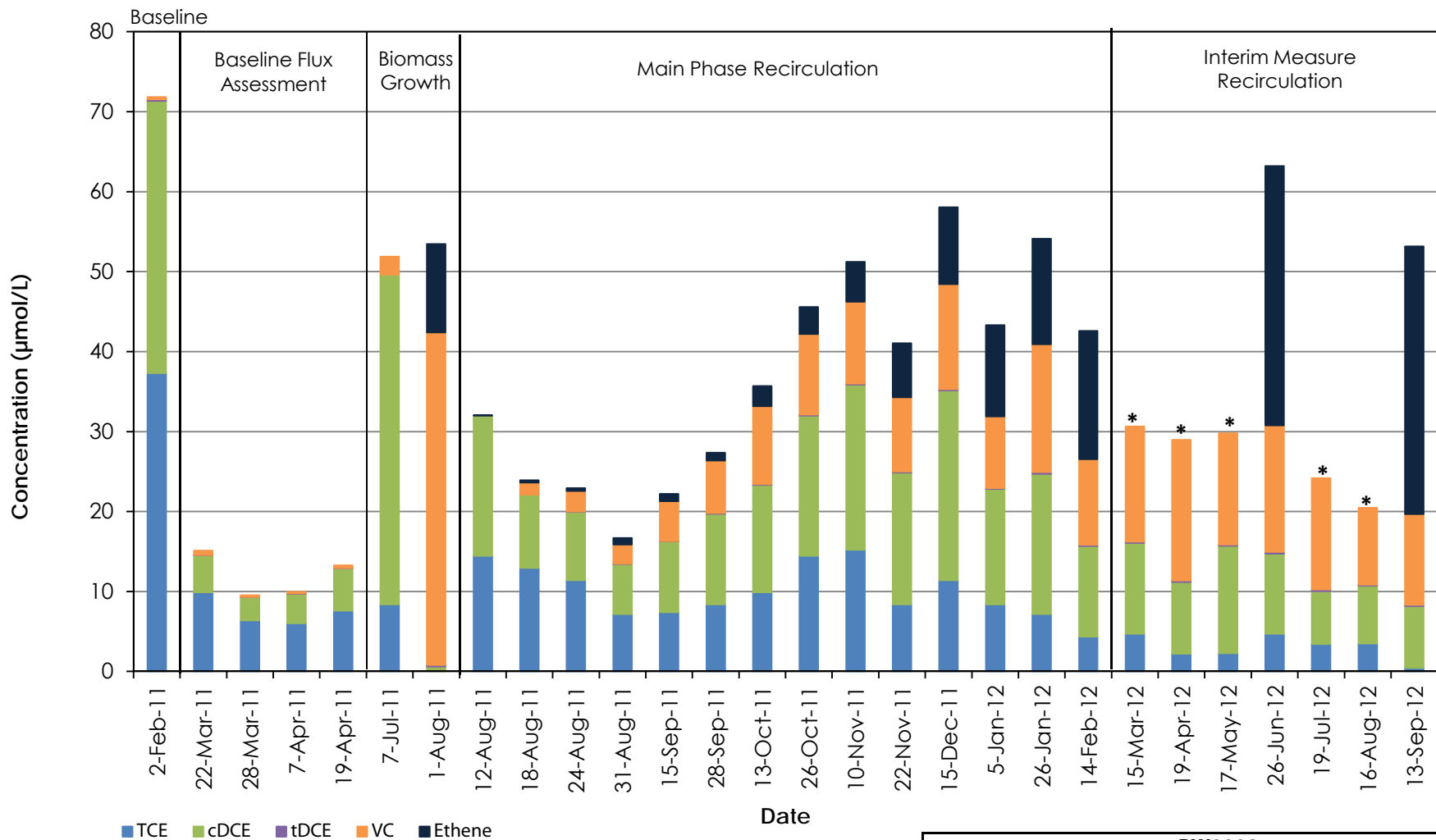
IW0076 Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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Notes:

Bars represent detected data only
 µmol/L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride
 * - no analysis for ethene

RW0007 Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL	
Guelph	May 2014
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Notes:

Bars represent detected data only
 µmol/ L - micromoles per liter
 cDCE - cis-1,2-Dichloroethene
 TCE - Trichloroethene
 tDCE - trans-1,2-Dichloroethene
 VC - Vinyl chloride
 * - no analysis for ethene

RW0008 Volatile Organic Compound Distribution History Launch Complex 34, Cape Canaveral, FL		Appendix E
Guelph	May 2014	

ATTACHMENT E-4
DATA ANALYSIS

Table E-4-1	Recovery of PED and Tracers in Confirmation Grab Samples
Table E-4-2	Comparison of PED and Tracer Concentrations in Well Samples – Post-Injection, 07 July 2011
Table E-4-3	Comparison of PED and Tracer Concentrations in Well Samples – Post-Biomass Growth Phase, 01 August 2011
Figure E-4-1	Normalized TOC and Tracer Recovery
Figure E-4-2	Tracer Recovery at Extraction Wells
Figure E-4-3	TOC Recovery at Extraction Wells

Table E-4-1. Recovery of PED and Tracers in Confirmation Grab Samples

Location	Sample Date	Sample Interval (ft BLS)	nBA (µg/L)	nBUT (µg/L)	Br (mg/L)	I (mg/L)	Br/I	Br/Br ⁽⁰⁾	I/I ⁽⁰⁾	Br'/I'	nBA/nBA ⁽⁰⁾	nBA'/Br'
LC34-DPT0328	06/30/2011	28 to 32	1,500	25,000 U	1 U	2 U	ND	ND	ND	NA	0.001	NA
	06/30/2011	37 to 41	19,000	25,000 U	2	2 U	ND	0.028	ND	NA	0.006	0.228
	06/30/2011	43 to 47	640	13,000 U	1.9	2 U	ND	0.026	ND	NA	0.000	0.008
	06/30/2011	49 to 53	26	NA	1.8	2 U	ND	0.025	ND	NA	0.000	0.000
	06/30/2011	55 to 59	440	NA	1.9	2 U	ND	0.026	ND	NA	0.000	0.006
LC34-DPT0329	06/30/2011	28 to 32	1,300,000	NA	NA	NA	NA	ND	ND	NA	0.433	NA
	06/30/2011	37 to 41	1,200,000	500,000 U	49.7	25	2.0	0.690	0.234	2.954	0.400	0.579
	06/30/2011	43 to 47	1,300,000	NA	45.8	2 U	ND	0.636	ND	NA	0.433	0.681
	06/30/2011	49 to 53	1,700,000	NA	NA	NA	ND	ND	ND	NA	0.567	NA
LC34-DPT0330	06/30/2011	8 to 12	1,600	NA	NA	NA	NA	ND	ND	NA	0.001	NA
	06/30/2011	28 to 32	19,000	NA	NA	NA	NA	ND	ND	NA	0.006	NA
	06/30/2011	37 to 41	20,000	25,000 U	2.5	2 U	ND	0.035	ND	NA	0.007	0.192
	06/30/2011	43 to 47	860,000	75,000	27.9	2 U	ND	0.388	ND	NA	0.326	0.841
	06/30/2011	49 to 53	97,000	19,000	4.2	2 U	ND	0.058	ND	NA	0.042	0.724
LC34-DPT0331	06/30/2011	14 to 18	1,700	NA	1 U	NA	ND	ND	ND	NA	0.001	NA
	06/30/2011	28 to 32	24,000	NA	1.8	2.8	0.6	0.025	0.026	0.955	0.008	0.320
	06/30/2011	37 to 41	490,000	27,000 U	6.2	3.6	1.7	0.086	0.034	2.559	0.163	1.897
	06/30/2011	43 to 47	55,000	50,000 U	1.7	2 U	ND	0.024	ND	NA	0.018	0.776
Average								0.171	0.098		0.134	0.521

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. mg/L indicates milligrams per liter.
4. ND indicates non-detect.
5. U indicates result not detected above method detection limit (MDL).
6. NA indicates not analyzed or not applicable.
7. nBA - n-Butyl Acetate
8. nBUT - n-Butanol
9. Br - Bromide
10. I - Iodide
11. Br⁽⁰⁾ - Bromide concentration in injectate
12. I⁽⁰⁾ - Iodide concentration in injectate
13. ' indicates normalized concentration; i.e., Br' = Br/Br⁽⁰⁾

Table E-4-2. Comparison of PED and Tracer Concentrations in Well Samples - Post-Injection, 07 July 2011

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Br (mg/L)	I (mg/L)	nBA (µg/L)	nBUT (µg/L)	Br/Br ⁽⁰⁾	I/I ⁽⁰⁾	Br'/I'	nBUT/nBA (mol basis)	nBA (µmol/L)	nBUT (µmol/L)	nBA+nBUT (µmol/L)	nBUT/(nBUT+nBA)	Total nBA Equivalents (µg/L)	Total nBA/nBA ⁽⁰⁾	Total nBA'/Br'
LC34-BW0001C	07/07/2011	37 to 40	NA	15	22	420,000	320,000	0.206	0.206	1.000	1.19	3615.7	4317.3	7933.0	0.54	921,500	0.307	1.49
LC34-BW0001D	07/07/2011	44 to 47	NA	3.6	0.20 U	60,000	23,000	0.050	ND	NA	0.60	516.5	310.3	826.8	0.38	96,045	0.032	0.64
LC34-BW0001E	07/07/2011	51 to 54	NA	2.2	0.20 U	3,500	1,500	0.031	ND	NA	0.67	30.1	20.2	50.4	0.40	5,851	0.002	0.06
LC34-BW0002C	07/07/2011	37 to 40	NA	24	14	490,000	120,000	0.335	0.135	2.487	0.38	4218.3	1619.0	5837.3	0.28	678,063	0.226	0.68
LC34-BW0002D	07/07/2011	44 to 47	NA	2.2	0.20 U	49	ND	0.031	ND	NA	ND	0.4	ND	0.4	NA	49	0.000	--
LC34-BW0002E	07/07/2011	51 to 54	NA	2.5	0.20 U	3,300	2,000	0.035	ND	NA	0.95	28.4	27.0	55.4	0.49	6,434	0.002	0.06
LC34-BW0003C	07/07/2011	37 to 40	NA	36	58	640,000	360,000	0.501	0.542	0.925	0.88	5509.6	4857.0	10366.6	0.47	1,204,188	0.401	0.80
LC34-BW0003D	07/07/2011	44 to 47	NA	24	0.20 U	830,000	350,000	0.326	ND	NA	0.66	7145.3	4722.1	11867.4	0.40	1,378,516	0.460	1.41
LC34-BW0003E	07/07/2011	51 to 54	NA	45	0.20 U	1,500,000	520,000	0.618	ND	NA	0.54	12913.2	7015.7	19928.9	0.35	2,314,938	0.772	1.25
LC34-RW0007	07/07/2011	35 to 42	NA	17	2.1	410,000	140,000	0.242	0.020	12.313	0.54	3529.6	1888.8	5418.4	0.35	629,406	0.210	0.87
LC34-RW0008	07/07/2011	47 to 57	NA	4.8	0.20 U	81,000	8,700	0.067	ND	NA	0.17	697.3	117.4	814.7	0.14	94,635	0.032	0.47
Average						403,441	184,520	0.22	0.23		0.66			5,736	0.38	666,330	0.22	0.77

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. mg/L indicates milligrams per liter.
4. mol indicates moles.
5. µmol/L indicate micromoles per liter.
6. NA indicates not analyzed or not applicable.
7. ND indicates non-detect.
8. U indicates result not detected above the method detection limit (MDL).
9. nBA - n-Butyl Acetate
10. nBUT - n-Butanol
11. Br - Bromide
12. I - Iodide
13. TOC - total organic carbon
14. Br⁽⁰⁾ - Bromide concentration in injectate
15. I⁽⁰⁾ - Iodide concentration in injectate
16. TOC⁽⁰⁾ - TOC concentration in injectate
17. ' indicates normalized concentration; i.e., Br' = Br/Br⁽⁰⁾

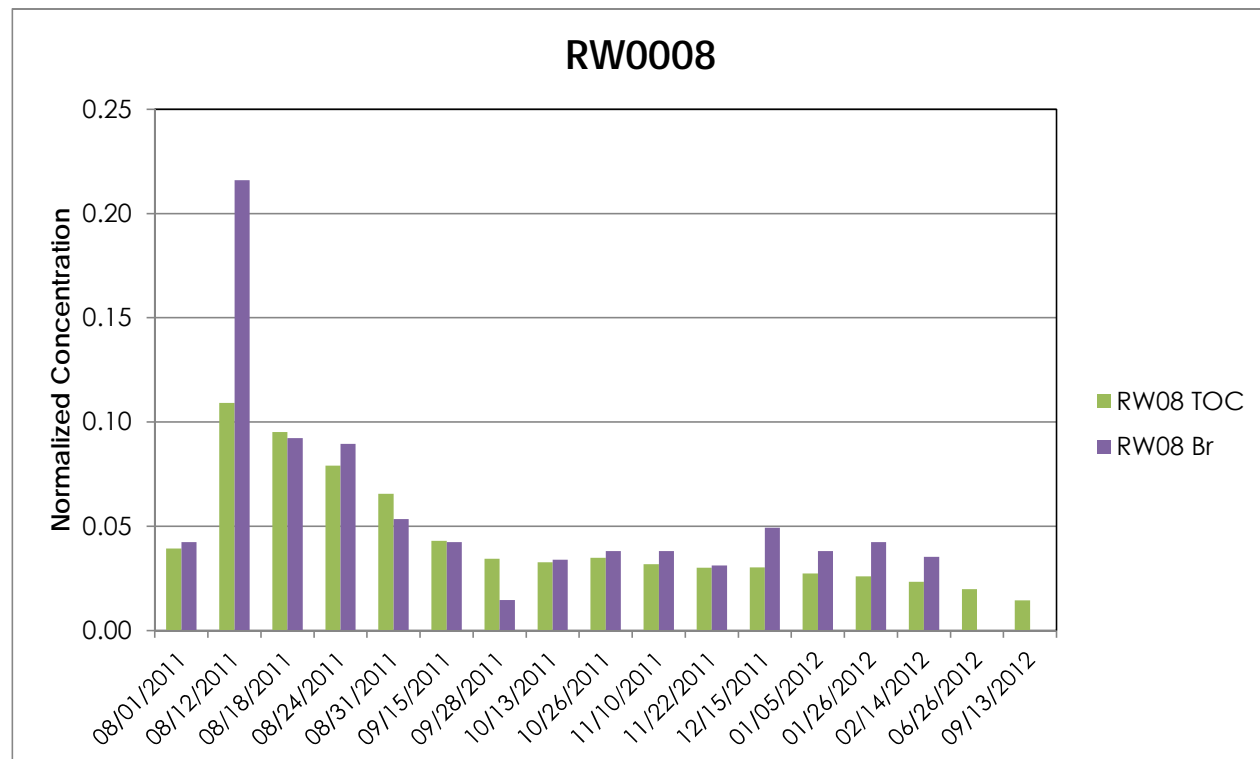
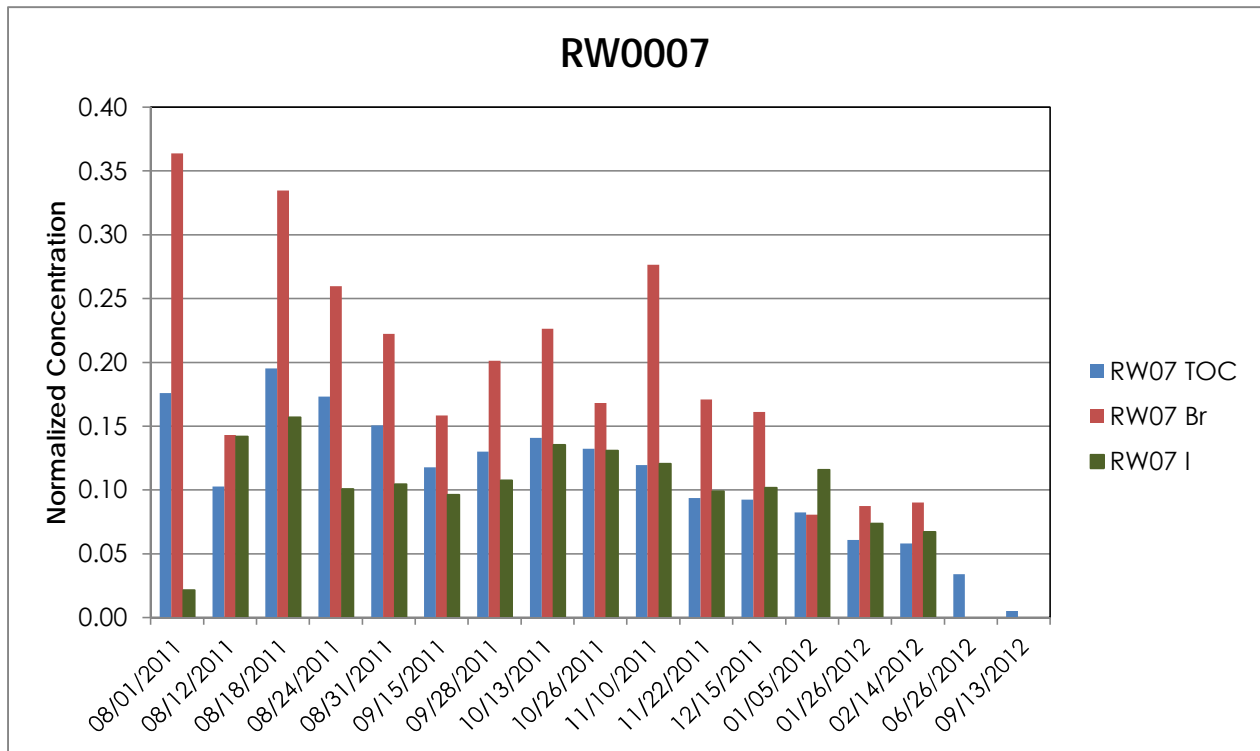
Table E-4-3. Comparison of PED and Tracer Concentrations in Well Samples - Post-Biomass Growth Phase, 01 August 2011

Location	Sample Date	Screen Interval (ft BLS)	TOC (mg/L)	Br (mg/L)	I (mg/L)	nBA (µg/L)	nBUT (µg/L)	Br/Br ⁽⁰⁾	I/I ⁽⁰⁾	Br'/I'	nBUT/nBA (mol basis)	nBA (µmol/L)	nBUT (µmol/L)	nBA+nBUT (µmol/L)	nBUT/(nBUT+nBA)	Equiv nBA (µg/L)	Total nBA/nBA ⁽⁰⁾	Total nBA'/Br'	TOC/TOC ⁽⁰⁾	TOC'/Br'
LC34-BW0001A	08/01/2011	23 to 26	4.2	0.60 U	0.20 U	340	NA	ND	ND	NA	NA	2.9	NA	2.9	NA	340	0.000	NA	0.002	NA
LC34-BW0001B	08/01/2011	30 to 33	8.0	0.60 U	0.20 U	1,000	NA	ND	ND	NA	NA	8.6	NA	8.6	NA	1,000	0.000	NA	0.004	NA
LC34-BW0001C	08/01/2011	37 to 40	301	23	18	95,000	280,000	0.322	0.167	1.926	4.6	817.8	3,777.7	4,595.5	0.82	533,813	0.178	0.55	0.162	0.502
LC34-BW0001D	08/01/2011	44 to 47	37	2.9	0.20 U	71,000	15,000	0.040	ND	NA	0.3	611.2	202.4	813.6	0.25	94,508	0.032	0.78	0.020	0.497
LC34-BW0001E	08/01/2011	51 to 54	8.3	1.4	0.20 U	4.6	730	0.019	ND	NA	248.7	0.0	9.8	9.9	1.00	1,149	0.000	NA	0.004	NA
LC34-BW0001F	08/01/2011	58 to 61	606	27	0.20 U	900,000	620,000	0.374	ND	NA	1.1	7,747.9	8,364.8	16,112.7	0.52	1,871,657	0.624	1.67	0.326	0.872
LC34-BW0002A	08/02/2011	23 to 26	3.7	0.60 U	0.20 U	150	11,000	ND	ND	NA	114.9	1.3	148.4	149.7	0.99	17,389	0.006	NA	0.002	NA
LC34-BW0002B	08/02/2011	30 to 33	13	0.60 U	0.20 U	130	NA	ND	ND	NA	NA	1.1	NA	NA	NA	NA	NA	NA	0.007	NA
LC34-BW0002C	08/02/2011	37 to 40	354	7.6	13	42,000	210,000	0.106	0.121	0.876	7.8	361.6	2,833.2	3,194.8	0.89	371,110	0.124	1.17	0.190	1.803
LC34-BW0002D	08/02/2011	44 to 47	4.1	1.1	0.20 U	86	530 U	0.015	ND	NA	NA	0.7	ND	0.7	NA	86	0.000	NA	0.002	NA
LC34-BW0002E	08/02/2011	51 to 54	4.4	1.4	0.20 U	43	150	0.019	ND	NA	5.5	0.4	2.0	2.4	0.85	278	0.000	NA	0.002	NA
LC34-BW0002F	08/02/2011	58 to 61	7.1	2.3	0.20 U	0.41	NA	0.032	ND	NA	NA	0.0	NA	0.0	NA	0	0.000	0.00	0.004	0.119
LC34-BW0003A	08/02/2011	23 to 26	7.2	0.60 U	0.20 U	0.000001	NA	ND	ND	NA	NA	0.0	NA	0.0	NA	0	0.000	NA	0.004	NA
LC34-BW0003B	08/02/2011	30 to 33	89	7.7	9.6	88	NA	0.107	0.090	1.192	NA	0.8	NA	0.8	NA	88	0.000	0.00	0.048	0.447
LC34-BW0003C	08/02/2011	37 to 40	671	52	64	290	190,000	0.722	0.599	1.206	1,026.8	2.5	2,563.4	2,565.9	1.00	298,056	0.099	0.14	0.361	0.500
LC34-BW0003D	08/02/2011	44 to 47	603	38	0.20 U	170,000	510,000	0.533	ND	NA	4.7	1,463.5	6,880.7	8,344.2	0.82	969,266	0.323	0.61	0.324	0.608
LC34-BW0003E	08/02/2011	51 to 54	905	58	0.20 U	420,000	890,000	0.808	ND	NA	3.3	3,615.7	12,007.6	15,623.3	0.77	1,814,798	0.605	0.75	0.487	0.602
LC34-BW0003F	08/02/2011	58 to 61	107	2.5	0.20 U	93	18,000	0.035	ND	NA	303.3	0.8	242.8	243.7	1.00	28,302	0.009	0.27	0.058	1.657
LC34-IW0002I	08/01/2011	25 to 30	487	35	45	11,000	630,000	0.483	0.416	1.162	89.8	94.7	8,499.7	8,594.4	0.99	998,329	0.333	0.69	0.262	0.542
LC34-IW0002D	08/01/2011	35 to 40	1,130	9.1	42	110	200,000	0.126	0.389	0.325	2,849.4	0.9	2,698.3	2,699.3	1.00	313,548	0.105	0.83	0.608	4.807
LC34-IW0002D1	08/01/2011	50 to 55	587	9.0	5.1	31	2,600	0.125	0.048	2.623	131.4	0.3	35.1	35.3	0.99	4,106	0.001	0.01	0.316	2.525
LC34-IW0076	08/01/2011	70 to 80	3.7	1.2	0.20 U	550	200	0.017	ND	NA	0.6	4.7	2.7	7.4	0.36	863	0.000	NA	0.002	NA
LC34-RW0007	08/01/2011	35 to 42	327	28	2.3	53 U	180,000	0.385	0.021	17.898	NA	ND	2,428.5	2,428.5	1.00	282,094	0.094	0.24	0.176	0.457
LC34-RW0008	08/01/2011	47 to 57	73	4.8	0.20 U	4	63	0.067	ND	NA	24.7	0.0	0.8	0.9	0.96	103	0.000	0.00	0.039	0.590
Average (all wells)						74,431	221,044	0.23	0.23					2,845	0.84	330,473	0.11	0.51	0.14	1.10
Average (subset of wells, same as 07/07/2011)						88,714	252,801	0.30	0.23					3,757	0.74	436,411	0.15	0.53	0.18	0.69

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. mg/L indicates milligrams per liter.
4. mol indicates moles.
5. µmol/L indicate micromoles per liter.
6. NA indicates not analyzed or not applicable.
7. ND indicates non-detect.
8. U indicates result not detected above the method detection limit (MDL).
9. nBA - n-Butyl Acetate
10. nBUT - n-Butanol
11. Br - Bromide
12. I - Iodide
13. TOC - total organic carbon
14. Br⁽⁰⁾ - Bromide concentration in injectate
15. I⁽⁰⁾ - Iodide concentration in injectate
16. TOC⁽⁰⁾ - TOC concentration in injectate
17. ' indicates normalized concentration; i.e., Br' = Br/Br⁽⁰⁾

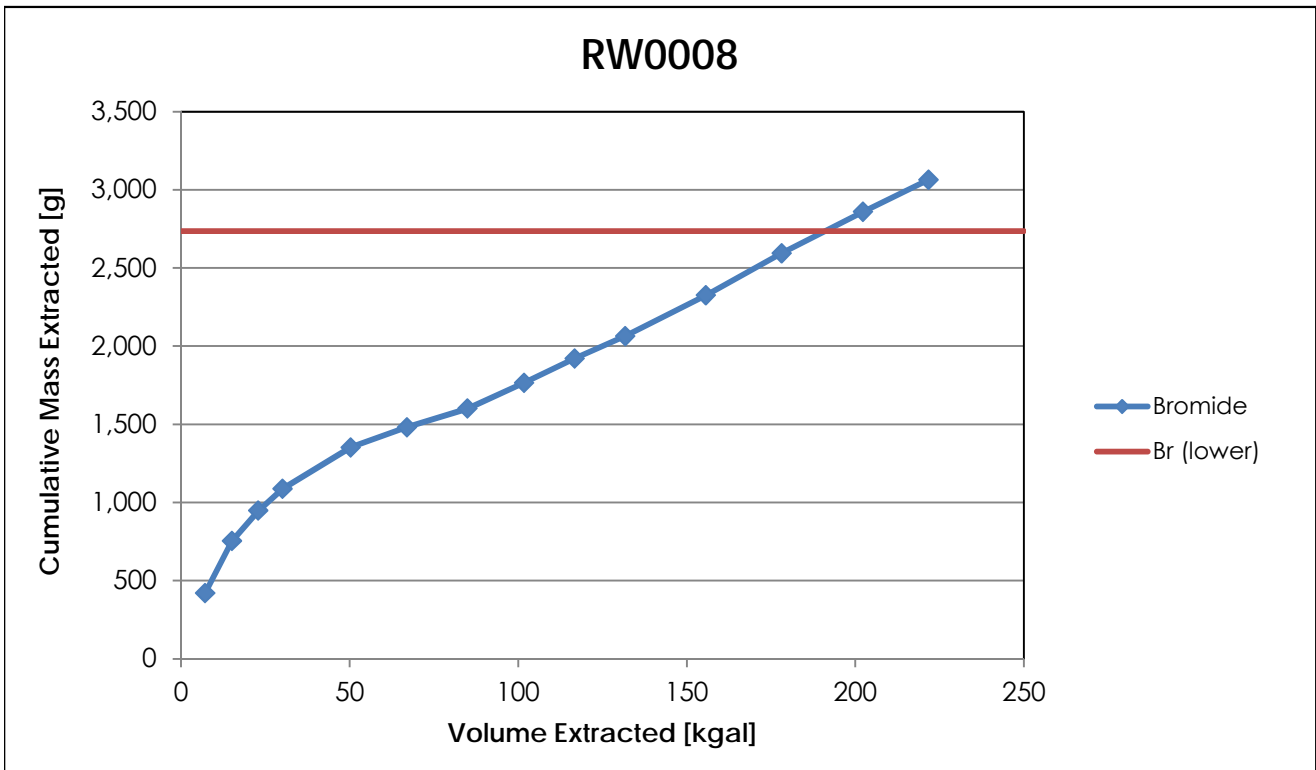
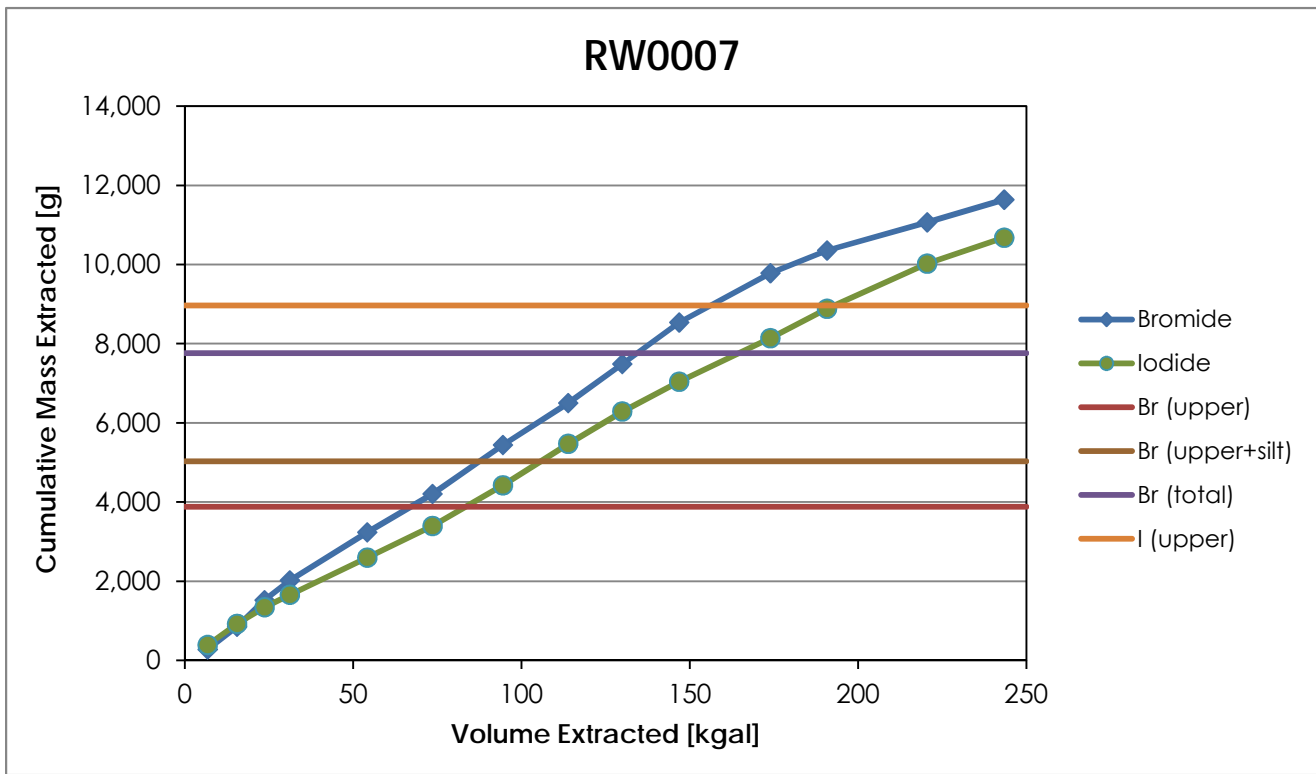
Figure E-4-1. Normalized TOC and Tracer Recovery from Extraction Wells



Notes:

1. Normalized concentration is the ratio of the measured concentration to the average concentration in the injectate, as determined from the batch QC samples.

Figure E-4-2. Tracer Recovery at Extraction Wells

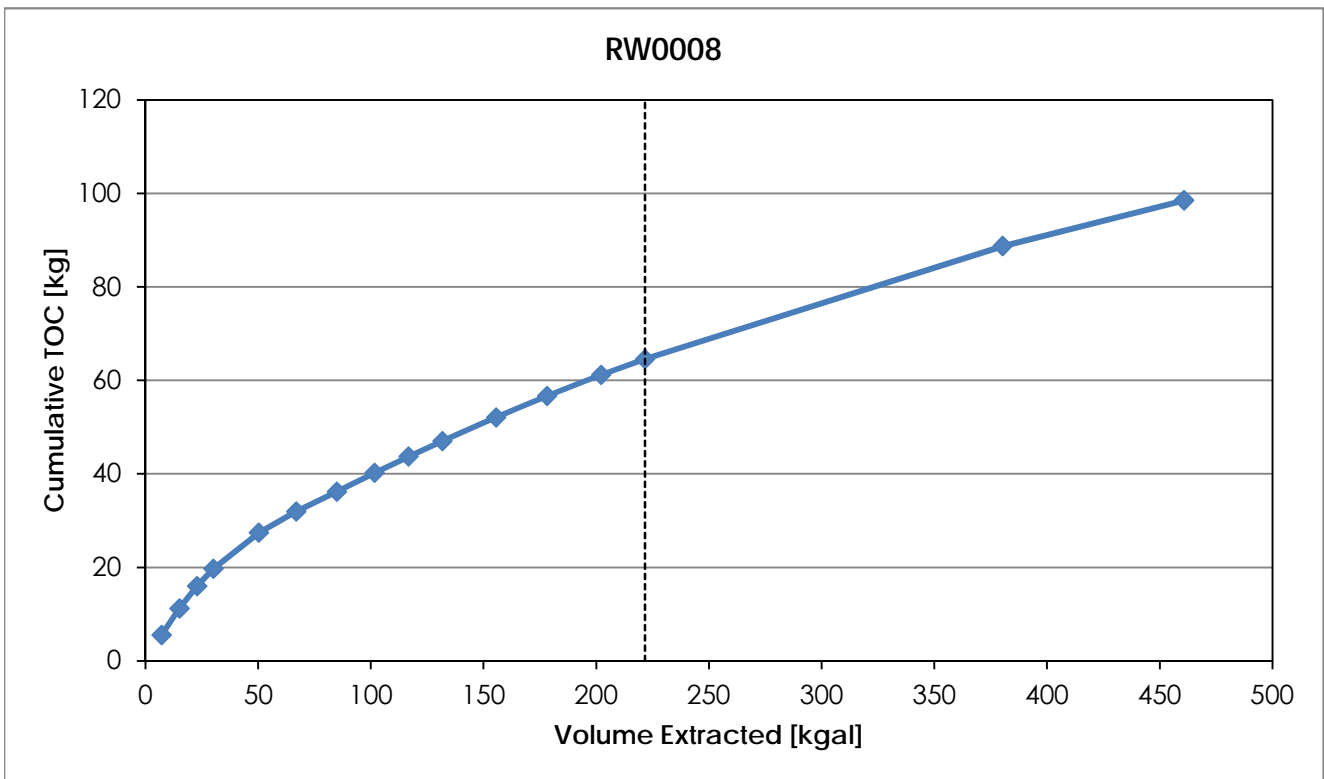
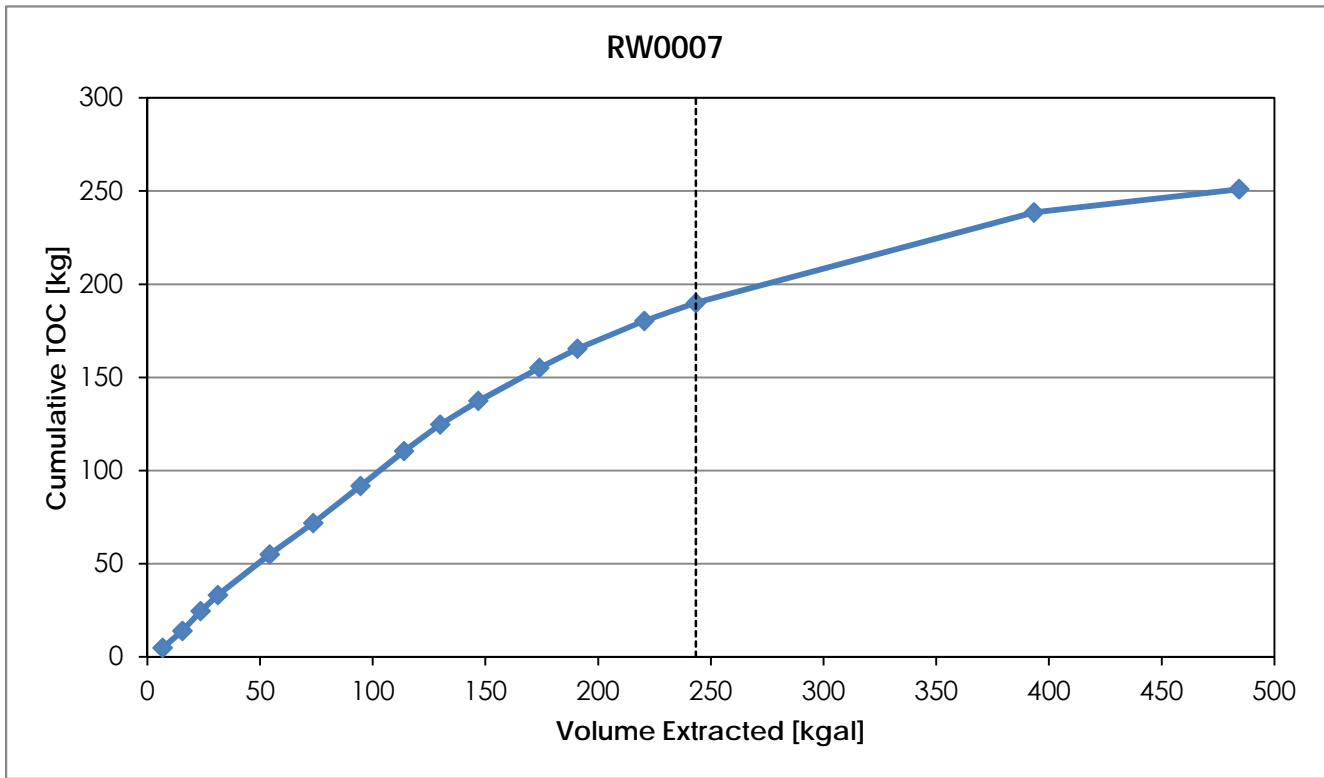


Notes:

Horizontal lines correspond to the mass of tracer added to the injectate targeting the upper zone, middle silty clay zone, and lower zone.

Iodide was only added to the upper zone; the horizontal line is also the total mass added.

Figure E-4-3. Cumulative TOC Recovery at Extraction Wells



Notes:

The total TOC added to the system was 238 kg (from 384 kg nBA). Based on the injection intervals, this corresponds to 119 kg to the upper zone, 35.7 kg to the middle silty clay zone, and 83.3 kg to the lower zone. Vertical dashed lines mark the end of the Main Recirculation Phase (February 2012).

ATTACHMENT E-5
DATA USING MOLAR BASIS

Table E-5-1	RW0007 Analytical Results ($\mu\text{g/L}$)
Table E-5-2	RW0007 Analytical results (molar concentrations)
Table E-5-3	RW0007 Extent of Dechlorination
Table E-5-4	RW0007 Cumulative Amounts of VOCs Extracted
Table E-5-5	RW0007 Carbon in TOC and VFAs (Molar Equivalents)
Table E-5-6	RW0008 Analytical Results ($\mu\text{g/L}$)
Table E-5-7	RW0008 Analytical results (molar concentrations)
Table E-5-8	RW0008 Extent of Dechlorination
Table E-5-9	RW0008 Cumulative Amounts of VOCs Extracted
Table E-5-10	RW0008 Carbon in TOC and VFAs (Molar Equivalents)
Figure E-5-1	RW0007 Cumulative VOCs Extracted
Figure E-5-2	RW0008 Cumulative VOCs Extracted

Table E-5-1. RW0007 Analytical Results (µg/L)

Event	Sample Date	TCE	cDCE	tDCE	VC	ethene	nBA	n-Butanol	CFC-113	methane
Baseline	02-Feb-2011	54,000	50,000	300	60 U	na	60 U	1,400 U	13,000	na
Baseline Flux Week 1	22-Mar-2011	14,000	27,000	210	610	na	75 U	1,700 U	7,400	na
Baseline Flux Week 2	28-Mar-2011	17,000	31,000	200	740	8.6	60 U	1,400 U	8,200	40
Baseline Flux Week 3	07-Apr-2011	14,000	33,000	290	1,000	na	75 U	1,700 U	11,000	na
Baseline Flux Week 4	19-Apr-2011	12,000	25,000	170	990	11	75 U	1,700 U	8,500	47
PED Distribution Check	07-Jul-2011	21,000	20,000	150	690	na	410,000	140,000	13,000	na
Post Biomass Growth	01-Aug-2011	2,400	31,000	130	770	9.8	53 U	180,000	2,900	35
Main Recirc Wk1	12-Aug-2011	3,300	26,000	50 U	58 U	14	33,000	230,000	16,000	93
Main Recirc Wk2	18-Aug-2011	7,100	23,000	50 U	1,400	14	53 U	130,000	11,000	76
Main Recirc Wk3	24-Aug-2011	10,000	21,000	130	1,700	12	42 U	26,000	13,000	100
Main Recirc Wk4	31-Aug-2011	10,000	20,000	150	2,000	15	21 U	29,000	13,000	150
Main Recirc Wk6	15-Sep-2011	8,400	19,000	150	3,100	33	21 U	1,100 U	14,000	290
Main Recirc Wk8	28-Sep-2011	5,700	15,000	140	3,700	53	21 U	2,700	12,000	380
Main Recirc Wk10	13-Oct-2011	4,300	15,000	190	4,300	86	21 U	2,900	11,000	420
Main Recirc Wk12	26-Oct-2011	3,900	16,000	170	4,800	110	21 U	1,800	11,000	330
Main Recirc Wk14	10-Nov-2011	3,500	16,000	200	6,400	150	21 U	1,100 U	12,000	520
Main Recirc Wk16	22-Nov-2011	3,200	14,000	160	4,900	190	21 U	1,100 U	13,000	510
Main Recirc Wk19	15-Dec-2011	1,500	11,000	180	6,000	300	21 U	1,100 U	7,500	1,100
Main Recirc Wk22	05-Jan-2012	160	4,500	200	6,200	740	11 U	530 U	2,600	3,200
Main Recirc Wk25	26-Jan-2012	1,700	15,000	250	10,000	480	0.21 U	11 U	11,000	1,300
Main Recirc Wk28	14-Feb-2012	560	8,900	250	6,400	500	11 U	530 U	5,600	1,100
IM Recirc Wk32	15-Mar-2012	120	3,600	160	3,000	na	5.3 U	270 U	870	na
IM Recirc Wk37	19-Apr-2012	650	7,200	200	8,100	na	5.3 U	270 U	8,200	na
IM Recirc Wk41	17-May-2012	520	6,000	190	8,700	na	11 U	530 U	11,000	na
IM Recirc Wk47	26-Jun-2012	820	5,500	250	8,100	1,200	11 U	530 U	9,500	1,700
IM Recirc Wk50	19-Jul-2012	640	4,600	260	7,900	na	21 U	1,100 U	8,900	na
IM Recirc Wk54	16-Aug-2012	660	4,300	190	7,400	na	20 U	870 U	8,700	na
IM Recirc Wk58	13-Sep-2012	210	2,300	100	2,000	370	7.9 U	350 U	2,900	360

Notes:

Concentrations reported in micrograms per liter (µg/L)

Qualifiers for detected data not shown. See Tables E-1-5 and E-1-6 for complete dataset.

PED addition was 21-Jun-11 to 28-Jun-11.

na - not analyzed/not available

Table E-5-2. RW0007 Analytical results (molar concentrations)

Event	Sample Date	TCE μmol/L	cDCE μmol/L	tDCE μmol/L	VC μmol/L	ethene μmol/L	nBA μmol/L	n-Butanol μmol/L	CFC-113 μmol/L	methane μmol/L	Total TCE-VOCs μmol/L	TVOC Ratio
Baseline	02-Feb-2011	411.0	515.7	3.1	0.0	0.0	0.0	0.0	69.38	NC	929.8	--
Baseline Flux Week 1	22-Mar-2011	106.6	278.5	2.2	9.8	0.0	0.0	0.0	39.49	NC	397.0	423.4
Baseline Flux Week 2	28-Mar-2011	129.4	319.8	2.1	11.8	0.3	0.0	0.0	43.76	2.49	463.4	
Baseline Flux Week 3	07-Apr-2011	106.6	340.4	3.0	16.0	0.0	0.0	0.0	58.71	NC	465.9	
Baseline Flux Week 4	19-Apr-2011	91.3	257.9	1.8	15.8	0.4	0.0	0.0	45.36	2.93	367.2	
PED Distribution Check	07-Jul-2011	159.8	206.3	1.5	11.0	0.0	3,529.7	1,888.8	69.38	NC	378.7	0.9
Post Biomass Growth	01-Aug-2011	18.3	319.8	1.3	12.3	0.3	0.0	2,428.5	15.48	2.18	352.0	0.8
Main Recirc Wk1	12-Aug-2011	25.1	268.2	0.0	0.0	0.5	284.1	3,103.1	85.39	5.80	293.8	0.7
Main Recirc Wk2	18-Aug-2011	54.0	237.2	0.0	22.4	0.5	0.0	1,753.9	58.71	4.74	314.2	0.7
Main Recirc Wk3	24-Aug-2011	76.1	216.6	1.3	27.2	0.4	0.0	350.8	69.38	6.23	321.7	0.8
Main Recirc Wk4	31-Aug-2011	76.1	206.3	1.5	32.0	0.5	0.0	391.3	69.38	9.35	316.5	0.7
Main Recirc Wk6	15-Sep-2011	63.9	196.0	1.5	49.6	1.2	0.0	0.0	74.72	18.08	312.2	0.7
Main Recirc Wk8	28-Sep-2011	43.4	154.7	1.4	59.2	1.9	0.0	36.4	64.04	23.69	260.6	0.6
Main Recirc Wk10	13-Oct-2011	32.7	154.7	2.0	68.8	3.1	0.0	39.1	58.71	26.18	261.3	0.6
Main Recirc Wk12	26-Oct-2011	29.7	165.0	1.8	76.8	3.9	0.0	24.3	58.71	20.57	277.2	0.7
Main Recirc Wk14	10-Nov-2011	26.6	165.0	2.1	102.4	5.3	0.0	0.0	64.04	32.42	301.5	0.7
Main Recirc Wk16	22-Nov-2011	24.4	144.4	1.7	78.4	6.8	0.0	0.0	69.38	31.80	255.6	0.6
Main Recirc Wk19	15-Dec-2011	11.4	113.5	1.9	96.0	10.7	0.0	0.0	40.03	68.58	233.4	0.6
Main Recirc Wk22	05-Jan-2012	1.2	46.4	2.1	99.2	26.4	0.0	0.0	13.88	199.50	175.3	0.4
Main Recirc Wk25	26-Jan-2012	12.9	154.7	2.6	160.0	17.1	0.0	0.0	58.71	81.05	347.4	0.8
Main Recirc Wk28	14-Feb-2012	4.3	91.8	2.6	102.4	17.8	0.0	0.0	29.89	68.58	218.9	0.5
IM Recirc Wk32	15-Mar-2012	0.9	37.1	1.7	48.0	NC	0.0	0.0	4.64	NC	87.7	0.2
IM Recirc Wk37	19-Apr-2012	4.9	74.3	2.1	129.6	NC	0.0	0.0	43.76	NC	210.9	0.5
IM Recirc Wk41	17-May-2012	4.0	61.9	2.0	139.2	NC	0.0	0.0	58.71	NC	207.0	0.5
IM Recirc Wk47	26-Jun-2012	6.2	56.7	2.6	129.6	42.8	0.0	0.0	50.70	105.99	237.9	0.6
IM Recirc Wk50	19-Jul-2012	4.9	47.4	2.7	126.4	NC	0.0	0.0	47.50	NC	181.4	0.4
IM Recirc Wk54	16-Aug-2012	5.0	44.4	2.0	118.4	NC	0.0	0.0	46.43	NC	169.7	0.4
IM Recirc Wk58	13-Sep-2012	1.6	23.7	1.0	32.0	13.2	0.0	0.0	15.48	22.44	71.5	0.2

Notes:

μmol/L - micromoles per liter

mmol/L - millimoles per liter

Values of 0.0 reflect non-detects (or not-analyzed) incorporated in calculations in subsequent tables.

NC - Not calculated, value may be non-detect or not available. See Tables E-1-5 and E-1-6 for complete dataset.

Table E-5-3. RW0007 Extent of Dechlorination

Event	Sample Date	Dechlorination Extent		Notes
		fraction	%	
Baseline	02-Feb-2011	0.186	19%	
Baseline Flux Week 1	22-Mar-2011	0.252	25%	
Baseline Flux Week 2	28-Mar-2011	0.249	25%	
Baseline Flux Week 3	07-Apr-2011	0.269	27%	
Baseline Flux Week 4	19-Apr-2011	0.266	27%	
PED Distribution Check	07-Jul-2011	0.202	20%	
Post Biomass Growth	01-Aug-2011	0.328	33%	
Main Recirc Wk1	12-Aug-2011	0.306	31%	
Main Recirc Wk2	18-Aug-2011	0.301	30%	
Main Recirc Wk3	24-Aug-2011	0.284	28%	
Main Recirc Wk4	31-Aug-2011	0.288	29%	
Main Recirc Wk6	15-Sep-2011	0.321	32%	
Main Recirc Wk8	28-Sep-2011	0.358	36%	
Main Recirc Wk10	13-Oct-2011	0.387	39%	
Main Recirc Wk12	26-Oct-2011	0.399	40%	
Main Recirc Wk14	10-Nov-2011	0.429	43%	
Main Recirc Wk16	22-Nov-2011	0.421	42%	
Main Recirc Wk19	15-Dec-2011	0.485	48%	
Main Recirc Wk22	05-Jan-2012	0.620	62%	
Main Recirc Wk25	26-Jan-2012	0.507	51%	
Main Recirc Wk28	14-Feb-2012	0.537	54%	
IM Recirc Wk32	15-Mar-2012	0.512	51%	no analysis for ethene, dechlorination extent is artificially low
IM Recirc Wk37	19-Apr-2012	0.530	53%	
IM Recirc Wk41	17-May-2012	0.551	55%	
IM Recirc Wk47	26-Jun-2012	0.626	63%	
IM Recirc Wk50	19-Jul-2012	0.557	56%	no analysis for ethene, dechlorination extent is artificially low
IM Recirc Wk54	16-Aug-2012	0.556	56%	
IM Recirc Wk58	13-Sep-2012	0.598	60%	

Notes:

Dechlorination extent (%) calculated using: $(1 - \frac{3[TCE]+2[cDCE]+2[tDCE]+[VC]}{3([TCE]+[cDCE]+[tDCE]+[VC]+[ethene])}) \times 100$

Table E-5-4. RW0007 Cumulative Amounts of VOCs Extracted

Event	Sample Date	Days	Volume Extracted (kgal)	Amount Extracted in Elapsed Interval (mol)						Amount Extracted Cumulative in Stage (mol)						
				TCE	cDCE	tDCE	VC	ethene	methane	TCE	cDCE	tDCE	VC	ethene	TVOCs	methane
Baseline	02-Feb-2011															
Baseline Flux Week 1	22-Mar-2011	7	16.3	6.6	17.1	0.1	0.6	0.0	0.0	6.6	17.1	0.1	0.6	0.0	24.4	0.0
Baseline Flux Week 2	28-Mar-2011	15	28.4	5.4	13.7	0.1	0.5	0.0	0.1	12.0	30.8	0.2	1.1	0.0	44.1	0.1
Baseline Flux Week 3	07-Apr-2011	24	41.0	5.6	15.8	0.1	0.7	0.0	0.1	17.6	46.6	0.4	1.8	0.0	66.3	0.1
Baseline Flux Week 4	19-Apr-2011	35	58.7	6.7	20.1	0.2	1.1	0.0	0.1	24.2	66.7	0.5	2.8	0.0	94.3	0.2
PED Distribution Check	07-Jul-2011															
Post Biomass Growth	01-Aug-2011															
		0	0													
Main Recirc Wk1	12-Aug-2011	3	6.8	0.6	6.9	0.0	0.0	0.0	0.1	0.6	6.9	0.0	0.0	0.0	7.6	0.1
Main Recirc Wk2	18-Aug-2011	9	15.5	1.3	8.3	0.0	0.4	0.0	0.2	1.9	15.2	0.0	0.4	0.0	17.6	0.3
Main Recirc Wk3	24-Aug-2011	15	23.7	2.0	7.0	0.0	0.8	0.0	0.2	4.0	22.2	0.0	1.1	0.0	27.4	0.4
Main Recirc Wk4	31-Aug-2011	22	31.2	2.2	6.1	0.0	0.8	0.0	0.2	6.1	28.3	0.1	2.0	0.1	36.5	0.7
Main Recirc Wk6	15-Sep-2011	37	54.2	6.1	17.5	0.1	3.5	0.1	1.2	12.2	45.8	0.2	5.5	0.1	63.9	1.9
Main Recirc Wk8	28-Sep-2011	50	73.6	3.9	12.9	0.1	4.0	0.1	1.5	16.2	58.7	0.3	9.5	0.2	84.9	3.4
Main Recirc Wk10	13-Oct-2011	65	94.5	3.0	12.2	0.1	5.1	0.2	2.0	19.2	70.9	0.4	14.6	0.4	105.6	5.4
Main Recirc Wk12	26-Oct-2011	79	113.9	2.3	11.7	0.1	5.3	0.3	1.7	21.5	82.6	0.6	19.9	0.7	125.3	7.1
Main Recirc Wk14	10-Nov-2011	93	129.9	1.7	10.0	0.1	5.4	0.3	1.6	23.2	92.6	0.7	25.4	1.0	142.9	8.7
Main Recirc Wk16	22-Nov-2011	105	146.9	1.6	9.9	0.1	5.8	0.4	2.1	24.8	102.6	0.8	31.2	1.4	160.7	10.7
Main Recirc Wk19	15-Dec-2011	128	173.9	1.8	13.2	0.2	8.9	0.9	5.1	26.6	115.8	1.0	40.1	2.3	185.8	15.9
Main Recirc Wk22	05-Jan-2012	149	190.8	0.4	5.1	0.1	6.2	1.2	8.5	27.1	120.9	1.1	46.3	3.4	198.8	24.4
Main Recirc Wk25	26-Jan-2012	170	220.5	0.8	11.3	0.3	14.6	2.4	15.8	27.8	132.2	1.4	60.9	5.9	228.2	40.2
Main Recirc Wk28	14-Feb-2012	189	243.4	0.7	10.7	0.2	11.4	1.5	6.5	28.6	142.9	1.6	72.3	7.4	252.8	46.7
IM Recirc Wk32	15-Mar-2012	219	269.3	0.3	6.3	0.2	7.4	0.9	3.4	28.8	149.2	1.8	79.6	8.3	267.8	50.1
IM Recirc Wk37	19-Apr-2012	254	309.6	0.4	8.5	0.3	13.6	0.0	0.0	29.3	157.7	2.1	93.2	8.3	290.6	50.1
IM Recirc Wk41	17-May-2012	282	349.0	0.7	10.1	0.3	20.0	0.0	0.0	30.0	167.8	2.4	113.2	8.3	321.7	50.1
IM Recirc Wk47	26-Jun-2012	322	393.4	0.9	10.0	0.4	22.6	3.6	8.9	30.8	177.8	2.8	135.8	11.9	359.1	59.0
IM Recirc Wk50	19-Jul-2012	345	423.1	0.6	5.9	0.3	14.4	2.4	6.0	31.4	183.7	3.1	150.2	14.3	382.7	64.9
IM Recirc Wk54	16-Aug-2012	373	460.6	0.7	6.5	0.3	17.4	0.0	0.0	32.1	190.2	3.4	167.6	14.3	407.6	64.9
IM Recirc Wk58	13-Sep-2012	401	492.2	0.4	4.1	0.2	9.0	0.8	1.3	32.5	194.2	3.6	176.6	15.1	422.0	66.3
				Mass removed, Baseline Flux weeks 1 - 4 (kg):						3.2	6.5	0.0	0.2	0.0	9.9	0.0
				Mass removed, weeks 1 - 28 (kg):						3.8	13.9	0.2	4.5	0.2	22.5	0.7
				Mass removed, weeks 29-58 (kg):						0.5	5.0	0.2	6.5	0.2	12.4	0.3
				Mass removed, weeks 1 - 58 (kg):						4.3	18.8	0.3	11.0	0.4	34.9	1.1

Notes:

kgal - kilogallons

kg - kilograms

TVOCs - total volatile organic compounds

Table E-5-5. RW0007 Carbon in TOC and VFAs (Molar Equivalents)

Event	Sample Date	Concentration (mg/L)				Molar Equivalents Carbon (mmol C/L)							
		TOC	Acetic Acid	Butanoic Acid	Propionic Acid	TOC	Acetic Acid	Butanoic Acid	Propionic Acid	Sum VFAs	nBA	nBuOH	Sum VOCs
Baseline Flux Week 1	22-Mar-2011	5.3	33	0.56	0.13	0.44	1.10	0.03	0.01	1.17	0	0	0.87
Baseline Flux Week 2	28-Mar-2011	4.9	0.073	0.56	0.13	0.41	0.00	0.03	0.01	0.03	0	0	1.02
Baseline Flux Week 3	07-Apr-2011	5.3	24	0.56	0.13	0.44	0.80	0.03	0.01	0.83	0	0	1.05
Baseline Flux Week 4	19-Apr-2011	4.4	22	0.56	0.13	0.37	0.73	0.03	0.01	0.76	0	0	0.83
Baseline Flux Week 4	19-Apr-2011*	4.5	22	0.56	0.13	0.38	0.73	0.03	0.01	0.76	0	0	0.83
Post Biomass Growth	01-Aug-2011	327	350	230	5.2	27.25	11.66	10.44	0.21	22.31	0	9.71	10.45
Main Recirc Wk1	12-Aug-2011	191	260	68	0.64	15.92	8.66	3.09	0.03	11.77	1.70	12.41	14.88
Main Recirc Wk2	18-Aug-2011	363	380	320	11	30.25	12.66	14.53	0.45	27.63	0	7.02	7.77
Main Recirc Wk3	24-Aug-2011	322	320	350	18	26.83	10.66	15.89	0.73	27.28	0	1.40	2.19
Main Recirc Wk4	31-Aug-2011	280	290	310	17	23.33	9.66	14.07	0.69	24.42	0	1.57	2.35
Main Recirc Wk6	15-Sep-2011	219	250	250	16	18.25	8.33	11.35	0.65	20.32	0	0	0.79
Main Recirc Wk8	28-Sep-2011	242	260	250	18	20.17	8.66	11.35	0.73	20.74	0	0.15	0.82
Main Recirc Wk10	13-Oct-2011	262	280	300	22	21.83	9.33	13.62	0.89	23.84	0	0.16	0.82
Main Recirc Wk12	26-Oct-2011	246	270	270	17	20.50	8.99	12.26	0.69	21.94	0	0.10	0.79
Main Recirc Wk14	10-Nov-2011	222	270	240	16	18.50	8.99	10.90	0.65	20.54	0	0	0.76
Main Recirc Wk16	22-Nov-2011	174	240	170	12	14.50	7.99	7.72	0.49	16.20	0	0	0.68
Main Recirc Wk19	15-Dec-2011	172	230	130	9.7	14.33	7.66	5.90	0.39	13.95	0	0	0.62
Main Recirc Wk22	05-Jan-2012	153	220	54	8.9	12.75	7.33	2.45	0.36	10.14	0	0	0.58
Main Recirc Wk25	26-Jan-2012	113	170	50	5.3	9.42	5.66	2.27	0.21	8.15	0	0	0.89
Main Recirc Wk28	14-Feb-2012	108	170	49	4.9	9.00	5.66	2.22	0.20	8.08	0	0	0.57
IM Recirc Wk47	26-Jun-2012	63	na	na	na	5.25	na	na	na	0.00	0	0	0.68
IM Recirc Wk58	13-Sep-2012	9.6	na	na	na	0.80	na	na	na	0.00	0	0	0.20

Notes:

* no VFA analysis

mg/L - milligrams per liter

mmol C/L - millimole equivalents of carbon per liter

na - not analyzed/not available

Table E-5-5. RW0007 Carbon in TOC and VFAs (Molar Equivalents)

Event	Sample Date	Ratios			VFAs - Percentage of Total VFAs			VFAs - Percentage of TOC		
		VFAs+VOCs	(VFAs+VOCs)/TOC	VFAs/TOC	Acetic:Total	Butanoic:Total	Propionic:Total	Acetic:TOC	Butanoic:TOC	Propionic:TOC
Baseline Flux Week 1	22-Mar-2011	2.04	4.62	2.65	0.973	0.023	0.005	2.488	0.058	0.012
Baseline Flux Week 2	28-Mar-2011	1.05	2.57	0.08	0.073	0.768	0.159	0.006	0.062	0.013
Baseline Flux Week 3	07-Apr-2011	1.88	4.25	1.88	0.963	0.031	0.006	1.810	0.058	0.012
Baseline Flux Week 4	19-Apr-2011	1.59	4.34	2.08	0.960	0.033	0.007	1.998	0.069	0.014
Baseline Flux Week 4	19-Apr-2011*	1.59	4.24	2.04	0.960	0.033	0.007	1.954	0.068	0.014
Post Biomass Growth	01-Aug-2011	32.76	1.20	0.82	0.522	0.468	0.009	0.428	0.383	0.008
Main Recirc Wk1	12-Aug-2011	26.65	1.67	0.74	0.736	0.262	0.002	0.544	0.194	0.002
Main Recirc Wk2	18-Aug-2011	35.40	1.17	0.91	0.458	0.526	0.016	0.418	0.480	0.015
Main Recirc Wk3	24-Aug-2011	29.47	1.10	1.02	0.391	0.583	0.027	0.397	0.592	0.027
Main Recirc Wk4	31-Aug-2011	26.77	1.15	1.05	0.395	0.576	0.028	0.414	0.603	0.030
Main Recirc Wk6	15-Sep-2011	21.12	1.16	1.11	0.410	0.558	0.032	0.456	0.622	0.036
Main Recirc Wk8	28-Sep-2011	21.56	1.07	1.03	0.418	0.547	0.035	0.429	0.563	0.036
Main Recirc Wk10	13-Oct-2011	24.66	1.13	1.09	0.391	0.571	0.037	0.427	0.624	0.041
Main Recirc Wk12	26-Oct-2011	22.73	1.11	1.07	0.410	0.559	0.031	0.439	0.598	0.034
Main Recirc Wk14	10-Nov-2011	21.30	1.15	1.11	0.438	0.531	0.032	0.486	0.589	0.035
Main Recirc Wk16	22-Nov-2011	16.88	1.16	1.12	0.493	0.477	0.030	0.551	0.532	0.034
Main Recirc Wk19	15-Dec-2011	14.57	1.02	0.97	0.549	0.423	0.028	0.534	0.412	0.027
Main Recirc Wk22	05-Jan-2012	10.72	0.84	0.80	0.723	0.242	0.036	0.575	0.192	0.028
Main Recirc Wk25	26-Jan-2012	9.04	0.96	0.87	0.695	0.279	0.026	0.601	0.241	0.023
Main Recirc Wk28	14-Feb-2012	8.65	0.96	0.90	0.700	0.275	0.025	0.629	0.247	0.022
IM Recirc Wk47	26-Jun-2012	0.68	na	na	na	na	na	na	na	na
IM Recirc Wk58	13-Sep-2012	0.20	na	na	na	na	na	na	na	na

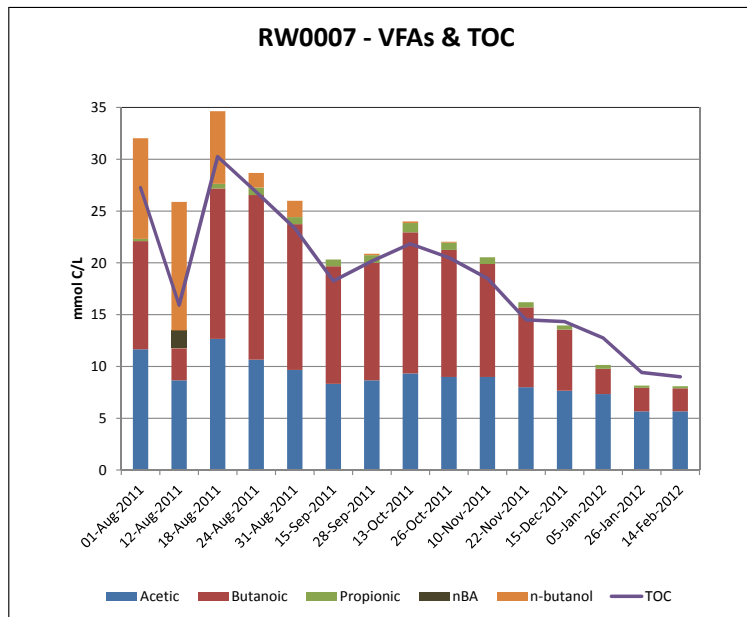


Table E-5-6. RW0008 Analytical Results (µg/L)

Event	Sample Date	TCE	cDCE	tDCE	VC	ethene	nBA	n-Butanol	CFC-113	methane
Baseline	02-Feb-2011	4,900	3,300	20	18	na	7.5 U	170 U	620	na
Baseline Flux Week 1	22-Mar-2011	1,300	450	3	34	na	3 U	67 U	190	na
Baseline Flux Week 2	28-Mar-2011	840	280	1.9	14	1 U	1.5 U	34 U	130	7.7
Baseline Flux Week 3	07-Apr-2011	790	360	1.9	13	na	1.5 U	34 U	140	na
Baseline Flux Week 4	19-Apr-2011	1,000	510	3	24	11	3 U	67 U	160	47
PED Distribution Check	07-Jul-2011	1,100	4,000	40 U	140	na	81,000	8,700	62	na
Post Biomass Growth	01-Aug-2011	4	55	19	2,600	310	4	63 B,J	3	30
Main Recirc Wk1	12-Aug-2011	1,900	1,700	4 U	4.7 U	2	8,100	120,000	710	120
Main Recirc Wk2	18-Aug-2011	1,700	890	2 U	94	7.8	2.1 U	9,300	580	300
Main Recirc Wk3	24-Aug-2011	1,500	830	3.9	160	9.3	2.1 U	110 U	580	370
Main Recirc Wk4	31-Aug-2011	940	610	3.2	150	23	1.1 U	53 U	310	520
Main Recirc Wk6	15-Sep-2011	970	860	5.4	310	26	1.1 U	53 U	470	430
Main Recirc Wk8	28-Sep-2011	1,100	1,100	7.6	410	28	1.1 U	53 U	590	410
Main Recirc Wk10	13-Oct-2011	1,300	1,300	10	610	71	2.1 U	110 U	760	460
Main Recirc Wk12	26-Oct-2011	1,900	1,700	12	630	95	2.1 U	110 U	1,200	400
Main Recirc Wk14	10-Nov-2011	2,000	2,000	14	640	140	2.1 U	110 U	1,500	450
Main Recirc Wk16	22-Nov-2011	1,100	1,600	12	580	190	2.1 U	110 U	1,100	450
Main Recirc Wk19	15-Dec-2011	1,500	2,300	17	820	270	4.2 U	210 U	1,700	600
Main Recirc Wk22	05-Jan-2012	1,100	1,400	12	560	320	2.1 U	110 U	1,300	670
Main Recirc Wk25	26-Jan-2012	940	1,700	22	1,000	370	2.1 U	110 U	1,600	490
Main Recirc Wk28	14-Feb-2012	570	1,100	14	670	450	2.1 U	110 U	850	510
IM Recirc Wk32	15-Mar-2012	620	1,100	17	900	na	2.1 U	110 U	1,100	na
IM Recirc Wk37	19-Apr-2012	290	870	17	1,100	na	2.1 U	110 U	670	na
IM Recirc Wk41	17-May-2012	300	1,300	18	870	na	2.1 U	110 U	1,100	na
IM Recirc Wk47	26-Jun-2012	620	970	21	990	910	1.1 U	53 U	900	620
IM Recirc Wk50	19-Jul-2012	450	640	23	870	na	1.1 U	53 U	840	na
IM Recirc Wk54	16-Aug-2012	460	700	13	600	na	2 U	87 U	1,100	na
IM Recirc Wk58	13-Sep-2012	56	750	14	710	940	2 U	87 U	530	760

Notes:

Concentrations reported in micrograms per liter (µg/L)

Qualifiers for detected data not shown. See Tables E-1-5 and E-1-6 for complete dataset.

na - not analyzed/not available

Table E-5-7. RW0008 Analytical results (molar concentrations)

Event	Sample Date	TCE μmol/L	cDCE μmol/L	tDCE μmol/L	VC μmol/L	ethene μmol/L	nBA μmol/L	n-Butanol μmol/L	CFC-113 μmol/L	methane μmol/L	Total TCE-VOCs μmol/L	TVOC Ratio
Baseline	02-Feb-2011	37.3	34.0	0.2	0.3	0.0	0.0	0.0	3.31	NC	71.8	
Baseline Flux Week 1	22-Mar-2011	9.9	4.6	0.0	0.5	0.0	0.0	0.0	1.01	NC	15.1	12.0
Baseline Flux Week 2	28-Mar-2011	6.4	2.9	0.0	0.2	0.0	0.0	0.0	0.69	0.48	9.5	
Baseline Flux Week 3	07-Apr-2011	6.0	3.7	0.0	0.2	0.0	0.0	0.0	0.75	NC	10.0	
Baseline Flux Week 4	19-Apr-2011	7.6	5.3	0.0	0.4	0.0	0.0	0.0	0.85	2.93	13.3	
PED Distribution Check	07-Jul-2011	8.4	41.3	0.0	2.2	0.0	697.3	117.4	0.33	NC	51.9	4.3
Post Biomass Growth	01-Aug-2011	0.0	0.6	0.2	41.6	11.1	0.03	0.0	0.02	1.87	53.4	4.5
Main Recirc Wk1	12-Aug-2011	14.5	17.5	0.0	0.0	0.1	69.7	1,619.0	3.79	7.48	32.1	2.7
Main Recirc Wk2	18-Aug-2011	12.9	9.2	0.0	1.5	0.3	0.0	125.5	3.10	18.70	23.9	2.0
Main Recirc Wk3	24-Aug-2011	11.4	8.6	0.0	2.6	0.3	0.0	0.0	3.10	23.07	22.9	1.9
Main Recirc Wk4	31-Aug-2011	7.2	6.3	0.0	2.4	0.8	0.0	0.0	1.65	32.42	16.7	1.4
Main Recirc Wk6	15-Sep-2011	7.4	8.9	0.1	5.0	0.9	0.0	0.0	2.51	26.81	22.2	1.9
Main Recirc Wk8	28-Sep-2011	8.4	11.3	0.1	6.6	1.0	0.0	0.0	3.15	25.56	27.4	2.3
Main Recirc Wk10	13-Oct-2011	9.9	13.4	0.1	9.8	2.5	0.0	0.0	4.06	28.68	35.7	3.0
Main Recirc Wk12	26-Oct-2011	14.5	17.5	0.1	10.1	3.4	0.0	0.0	6.40	24.94	45.6	3.8
Main Recirc Wk14	10-Nov-2011	15.2	20.6	0.1	10.2	5.0	0.0	0.0	8.01	28.05	51.2	4.3
Main Recirc Wk16	22-Nov-2011	8.4	16.5	0.1	9.3	6.8	0.0	0.0	5.87	28.05	41.1	3.4
Main Recirc Wk19	15-Dec-2011	11.4	23.7	0.2	13.1	9.6	0.0	0.0	9.07	37.41	58.1	4.9
Main Recirc Wk22	05-Jan-2012	8.4	14.4	0.1	9.0	11.4	0.0	0.0	6.94	41.77	43.3	3.6
Main Recirc Wk25	26-Jan-2012	7.2	17.5	0.2	16.0	13.2	0.0	0.0	8.54	30.55	54.1	4.5
Main Recirc Wk28	14-Feb-2012	4.3	11.3	0.1	10.7	16.0	0.0	0.0	4.54	31.80	42.6	3.6
IM Recirc Wk32	15-Mar-2012	4.7	11.3	0.2	14.4	NC	0.0	0.0	5.87	NC	30.6	2.6
IM Recirc Wk37	19-Apr-2012	2.2	9.0	0.2	17.6	NC	0.0	0.0	3.58	NC	29.0	2.4
IM Recirc Wk41	17-May-2012	2.3	13.4	0.2	13.9	NC	0.0	0.0	5.87	NC	29.8	2.5
IM Recirc Wk47	26-Jun-2012	4.7	10.0	0.2	15.8	32.4	0.0	0.0	4.80	38.65	63.2	5.3
IM Recirc Wk50	19-Jul-2012	3.4	6.6	0.2	13.9	NC	0.0	0.0	4.48	NC	24.2	2.0
IM Recirc Wk54	16-Aug-2012	3.5	7.2	0.1	9.6	NC	0.0	0.0	5.87	NC	20.5	1.7
IM Recirc Wk58	13-Sep-2012	0.4	7.7	0.1	11.4	33.5	0.0	0.0	2.83	47.38	53.2	4.4

Notes:

μmol/L - micromoles per liter

mmol/L - millimoles per liter

Values of 0.0 reflect non-detects incorporated in calculations in subsequent tables.

NC - Not calculated, value may be non-detect or not available. See Tables E-1-5 and E-1-6 for complete dataset.

Table E-5-8. RW0008 Extent of Dechlorination

Event	Sample Date	Dechlorination Extent		Notes
		fraction	%	
Baseline	02-Feb-2011	0.162	16%	
Baseline Flux Week 1	22-Mar-2011	0.127	13%	
Baseline Flux Week 2	28-Mar-2011	0.117	12%	
Baseline Flux Week 3	07-Apr-2011	0.139	14%	
Baseline Flux Week 4	19-Apr-2011	0.152	15%	
PED Distribution Check	07-Jul-2011	0.294	29%	
Post Biomass Growth	01-Aug-2011	0.730	73%	
Main Recirc Wk1	12-Aug-2011	0.184	18%	
Main Recirc Wk2	18-Aug-2011	0.182	18%	
Main Recirc Wk3	24-Aug-2011	0.214	21%	
Main Recirc Wk4	31-Aug-2011	0.271	27%	
Main Recirc Wk6	15-Sep-2011	0.325	32%	
Main Recirc Wk8	28-Sep-2011	0.336	34%	
Main Recirc Wk10	13-Oct-2011	0.379	38%	
Main Recirc Wk12	26-Oct-2011	0.351	35%	
Main Recirc Wk14	10-Nov-2011	0.366	37%	
Main Recirc Wk16	22-Nov-2011	0.451	45%	
Main Recirc Wk19	15-Dec-2011	0.454	45%	
Main Recirc Wk22	05-Jan-2012	0.513	51%	
Main Recirc Wk25	26-Jan-2012	0.550	55%	
Main Recirc Wk28	14-Feb-2012	0.634	63%	
IM Recirc Wk32	15-Mar-2012	0.439	44%	no analysis for ethene, dechlorination extent is artificially low
IM Recirc Wk37	19-Apr-2012	0.511	51%	
IM Recirc Wk41	17-May-2012	0.464	46%	
IM Recirc Wk47	26-Jun-2012	0.734	73%	
IM Recirc Wk50	19-Jul-2012	0.478	48%	no analysis for ethene, dechlorination extent is artificially low
IM Recirc Wk54	16-Aug-2012	0.433	43%	
IM Recirc Wk58	13-Sep-2012	0.822	82%	

Notes:

Dechlorination extent (%) calculated using: $(1 - \frac{3[TCE]+2[cDCE]+2[tDCE]+[VC]}{3([TCE]+[cDCE]+[tDCE]+[VC]+[ethene])}) \times 100$

Table E-5-9. RW0008 Cumulative Amounts of VOCs Extracted

Event	Sample Date	Days	Volume Extracted (kgal)	Amount Extracted in Elapsed Interval (mol)						Amount Extracted Cumulative in Stage (mol)								
				TCE	cDCE	tDCE	VC	ethene	methane	TCE	cDCE	tDCE	VC	ethene	TVOCs	methane		
Baseline	02-Feb-2011																	
Baseline Flux Week 1	22-Mar-2011	7	14.3	0.53	0.25	0.00	0.03	0.00	0.00	0.5	0.3	0.0	0.0	0.0	0.8	0.0		
Baseline Flux Week 2	28-Mar-2011	15	25.6	0.35	0.16	0.00	0.02	0.00	0.01	0.9	0.4	0.0	0.0	0.0	1.3	0.0		
Baseline Flux Week 3	07-Apr-2011	24	35.5	0.23	0.12	0.00	0.01	0.00	0.01	1.1	0.5	0.0	0.1	0.0	1.7	0.0		
Baseline Flux Week 4	19-Apr-2011	35	44.1	0.22	0.15	0.00	0.01	0.00	0.05	1.3	0.7	0.0	0.1	0.0	2.1	0.1		
PED Distribution Check	07-Jul-2011																	
Post Biomass Growth	01-Aug-2011																	
		0	0															
Main Recirc Wk1	12-Aug-2011	3	7.1	0.39	0.47	0.00	0.00	0.00	0.13	0.4	0.5	0.0	0.0	0.0	0.9	0.1		
Main Recirc Wk2	18-Aug-2011	9	15.1	0.41	0.40	0.00	0.02	0.01	0.39	0.8	0.9	0.0	0.0	0.0	1.7	0.5		
Main Recirc Wk3	24-Aug-2011	15	22.9	0.36	0.26	0.00	0.06	0.01	0.62	1.2	1.1	0.0	0.1	0.0	2.4	1.1		
Main Recirc Wk4	31-Aug-2011	22	30.1	0.25	0.20	0.00	0.07	0.02	0.76	1.4	1.3	0.0	0.2	0.0	2.9	1.9		
Main Recirc Wk6	15-Sep-2011	37	50.3	0.56	0.58	0.00	0.28	0.07	2.26	2.0	1.9	0.0	0.4	0.1	4.4	4.2		
Main Recirc Wk8	28-Sep-2011	50	67.0	0.50	0.64	0.00	0.36	0.06	1.65	2.5	2.6	0.0	0.8	0.2	6.0	5.8		
Main Recirc Wk10	13-Oct-2011	65	84.9	0.62	0.84	0.01	0.56	0.12	1.85	3.1	3.4	0.0	1.4	0.3	8.1	7.7		
Main Recirc Wk12	26-Oct-2011	79	101.7	0.77	0.98	0.01	0.63	0.19	1.70	3.9	4.4	0.0	2.0	0.5	10.7	9.4		
Main Recirc Wk14	10-Nov-2011	93	116.7	0.84	1.08	0.01	0.57	0.24	1.50	4.7	5.5	0.0	2.6	0.7	13.5	10.9		
Main Recirc Wk16	22-Nov-2011	105	131.8	0.67	1.06	0.01	0.56	0.34	1.60	5.4	6.5	0.0	3.1	1.0	16.1	12.5		
Main Recirc Wk19	15-Dec-2011	128	155.6	0.89	1.82	0.01	1.01	0.74	2.95	6.3	8.3	0.1	4.1	1.8	20.6	15.4		
Main Recirc Wk22	05-Jan-2012	149	178.2	0.84	1.63	0.01	0.94	0.90	3.38	7.1	10.0	0.1	5.1	2.7	24.9	18.8		
Main Recirc Wk25	26-Jan-2012	170	202.2	0.71	1.46	0.02	1.14	1.12	3.30	7.8	11.4	0.1	6.2	3.8	29.3	22.1		
Main Recirc Wk28	14-Feb-2012	189	221.6	0.42	1.06	0.01	0.98	1.07	2.29	8.2	12.5	0.1	7.2	4.9	32.9	24.4		
IM Recirc Wk32	15-Mar-2012	219	255.5	0.58	1.45	0.02	1.61	1.03	2.04	8.8	13.9	0.1	8.8	5.9	37.6	26.4		
IM Recirc Wk37	19-Apr-2012	254	305.5	0.66	1.92	0.03	3.03	0.00	0.00	9.5	15.9	0.1	11.8	5.9	43.2	26.4		
IM Recirc Wk41	17-May-2012	282	341.9	0.31	1.54	0.02	2.17	0.00	0.00	9.8	17.4	0.2	14.0	5.9	47.3	26.4		
IM Recirc Wk47	26-Jun-2012	322	380.3	0.51	1.70	0.03	2.16	2.36	2.81	10.3	19.1	0.2	16.2	8.3	54.0	29.2		
IM Recirc Wk50	19-Jul-2012	345	401.6	0.33	0.67	0.02	1.20	1.31	1.56	10.6	19.8	0.2	17.4	9.6	57.5	30.8		
IM Recirc Wk54	16-Aug-2012	373	438.0	0.48	0.95	0.03	1.62	0.00	0.00	11.1	20.7	0.2	19.0	9.6	60.6	30.8		
IM Recirc Wk58	13-Sep-2012	401	468.4	0.23	0.86	0.02	1.21	1.93	2.73	11.3	21.6	0.3	20.2	11.5	64.9	33.5		
										Mass removed, Baseline Flux weeks 1 - 4 (kg):		0.2	0.1	0.0	0.0	0.0	0.2	0.0
										Mass removed, weeks 1 - 28 (kg):		1.1	1.2	0.0	0.4	0.1	2.9	0.4
										Mass removed, weeks 29 - 58 (kg):		0.4	0.9	0.0	0.8	0.2	2.3	0.1
										Mass removed, weeks 1 - 58 (kg):		1.5	2.1	0.0	1.3	0.3	5.2	0.5

Notes:

kgal - kilogallons

kg - kilograms

TVOCs - total volatile organic compounds

Table E-5-10. RW0008 Carbon in TOC and VFAs (Molar Equivalents)

Event	Sample Date	Concentration (mg/L)				Molar Equivalents Carbon (mmol C/L)							
		TOC	Acetic Acid	Butanoic Acid	Propionic Acid	TOC	Acetic Acid	Butanoic Acid	Propionic Acid	Sum VFAs	nBA	nBuOH	Sum VOCs
Baseline Flux Week 1	22-Mar-2011	3.6	0.073	0.56	0.13	0.30	0.00	0.03	0.01	0.03	0	0	0.03
Baseline Flux Week 2	28-Mar-2011	3.5	0.073	0.56	0.13	0.29	0.00	0.03	0.01	0.03	0	0	0.02
Baseline Flux Week 3	07-Apr-2011	3.5	0.073	0.56	0.13	0.29	0.00	0.03	0.01	0.03	0	0	0.02
Baseline Flux Week 4	19-Apr-2011	3.4	1	0.56	0.13	0.28	0.03	0.03	0.01	0.06	0	0	0.03
Post Biomass Growth	01-Aug-2011	73.1	130	28	1.1	6.09	4.33	1.27	0.04	5.65	0	0	0.11
Main Recirc Wk1	12-Aug-2011	203	220	150	5.5	16.92	7.33	6.81	0.22	14.36	0.42	6.48	6.97
Main Recirc Wk2	18-Aug-2011	177	230	150	12	14.75	7.66	6.81	0.49	14.96	0	0.50	0.57
Main Recirc Wk3	24-Aug-2011	147	220	100	15	12.25	7.33	4.54	0.61	12.47	0	0	0.08
Main Recirc Wk4	31-Aug-2011	122	210	72	15	10.17	6.99	3.27	0.61	10.87	0	0	0.07
Main Recirc Wk6	15-Sep-2011	80	140	34	5.1	6.67	4.66	1.54	0.21	6.41	0	0	0.08
Main Recirc Wk8	28-Sep-2011	64	140	12	2.2	5.33	4.66	0.54	0.09	5.30	0	0	0.09
Main Recirc Wk10	13-Oct-2011	61	130	16	1.8	5.08	4.33	0.73	0.07	5.13	0	0	0.11
Main Recirc Wk12	26-Oct-2011	65	130	19	1.4	5.42	4.33	0.86	0.06	5.25	0	0	0.13
Main Recirc Wk14	10-Nov-2011	59.2	120	22	1.4	4.93	4.00	1.00	0.06	5.05	0	0	0.15
Main Recirc Wk16	22-Nov-2011	56	120	18	1.6	4.67	4.00	0.82	0.06	4.88	0	0	0.12
Main Recirc Wk19	15-Dec-2011	56.3	120	13	1.6	4.69	4.00	0.59	0.06	4.65	0	0	0.17
Main Recirc Wk22	05-Jan-2012	50.9	96	8.5	1.4	4.24	3.20	0.39	0.06	3.64	0	0	0.14
Main Recirc Wk25	26-Jan-2012	48.3	100	7.1	1.2	4.03	3.33	0.32	0.05	3.70	0	0	0.16
Main Recirc Wk28	14-Feb-2012	43.5	91	4.8	1.2	3.63	3.03	0.22	0.05	3.30	0	0	0.13
IM Recirc Wk47	26-Jun-2012	37.1	na	na	na	3.09	na	na	na	0.00	0	0	0.17
IM Recirc Wk58	13-Sep-2012	27	na	na	na	2.25	na	na	na	0.00	0	0	0.16

Notes:

* no VFA analysis

mg/L - milligrams per liter

mmol C/L - millimole equivalents of carbon per liter

na - not analyzed/not available

Table E-5-10. RW0008 Carbon in TOC and VFAs (Molar Equivalents)

Event	Sample Date	Ratios			VFAs - Percentage of Total VFAs			VFAs - Percentage of TOC		
		VFAs+VOCs	(VFAs+VOCs)/TOC	VFAs/TOC	Acetic:Total	Butanoic:Total	Propionic:Total	Acetic:TOC	Butanoic:TOC	Propionic:TOC
Baseline Flux Week 1	22-Mar-2011	0.07	0.22	0.11	0.073	0.768	0.159	0.008	0.085	0.018
Baseline Flux Week 2	28-Mar-2011	0.05	0.19	0.11	0.073	0.768	0.159	0.008	0.087	0.018
Baseline Flux Week 3	07-Apr-2011	0.05	0.19	0.11	0.073	0.768	0.159	0.008	0.087	0.018
Baseline Flux Week 4	19-Apr-2011	0.10	0.34	0.23	0.520	0.397	0.082	0.118	0.090	0.019
Post Biomass Growth	01-Aug-2011	5.75	0.94	0.93	0.767	0.225	0.008	0.711	0.209	0.007
Main Recirc Wk1	12-Aug-2011	21.33	1.26	0.85	0.510	0.474	0.016	0.433	0.403	0.013
Main Recirc Wk2	18-Aug-2011	15.53	1.05	1.01	0.512	0.455	0.032	0.519	0.462	0.033
Main Recirc Wk3	24-Aug-2011	12.55	1.02	1.02	0.587	0.364	0.049	0.598	0.371	0.050
Main Recirc Wk4	31-Aug-2011	10.94	1.08	1.07	0.643	0.301	0.056	0.688	0.322	0.060
Main Recirc Wk6	15-Sep-2011	6.49	0.97	0.96	0.727	0.241	0.032	0.699	0.232	0.031
Main Recirc Wk8	28-Sep-2011	5.38	1.01	0.99	0.880	0.103	0.017	0.874	0.102	0.017
Main Recirc Wk10	13-Oct-2011	5.24	1.03	1.01	0.844	0.142	0.014	0.852	0.143	0.014
Main Recirc Wk12	26-Oct-2011	5.38	0.99	0.97	0.825	0.164	0.011	0.799	0.159	0.010
Main Recirc Wk14	10-Nov-2011	5.20	1.05	1.02	0.791	0.198	0.011	0.810	0.202	0.011
Main Recirc Wk16	22-Nov-2011	5.00	1.07	1.05	0.819	0.168	0.013	0.856	0.175	0.014
Main Recirc Wk19	15-Dec-2011	4.82	1.03	0.99	0.859	0.127	0.014	0.852	0.126	0.014
Main Recirc Wk22	05-Jan-2012	3.78	0.89	0.86	0.878	0.106	0.016	0.754	0.091	0.013
Main Recirc Wk25	26-Jan-2012	3.86	0.96	0.92	0.900	0.087	0.013	0.827	0.080	0.012
Main Recirc Wk28	14-Feb-2012	3.42	0.94	0.91	0.919	0.066	0.015	0.836	0.060	0.013
IM Recirc Wk47	26-Jun-2012	0.17	na	na	na	na	na	na	na	na
IM Recirc Wk58	13-Sep-2012	0.16	na	na	na	na	na	na	na	na

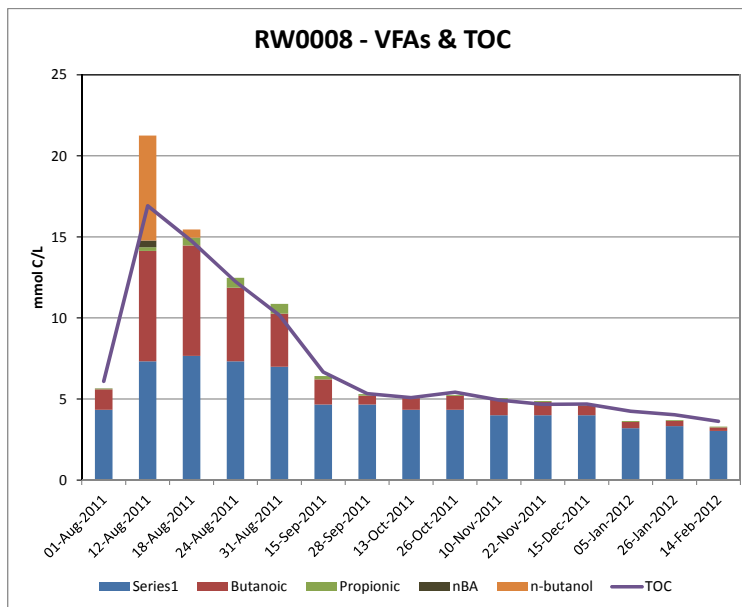


Figure E-5-1. RW0007 Cumulative VOCs Extracted

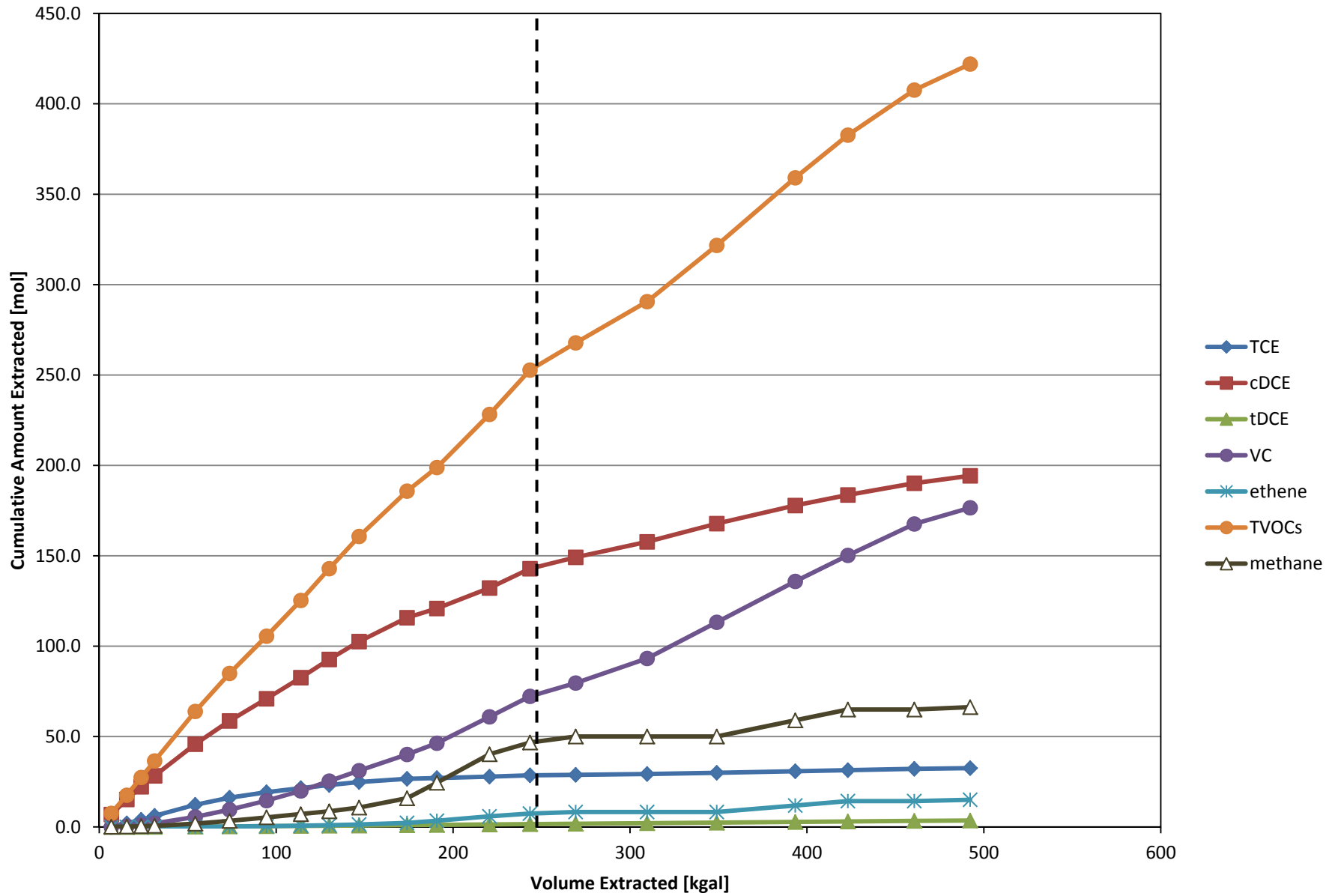
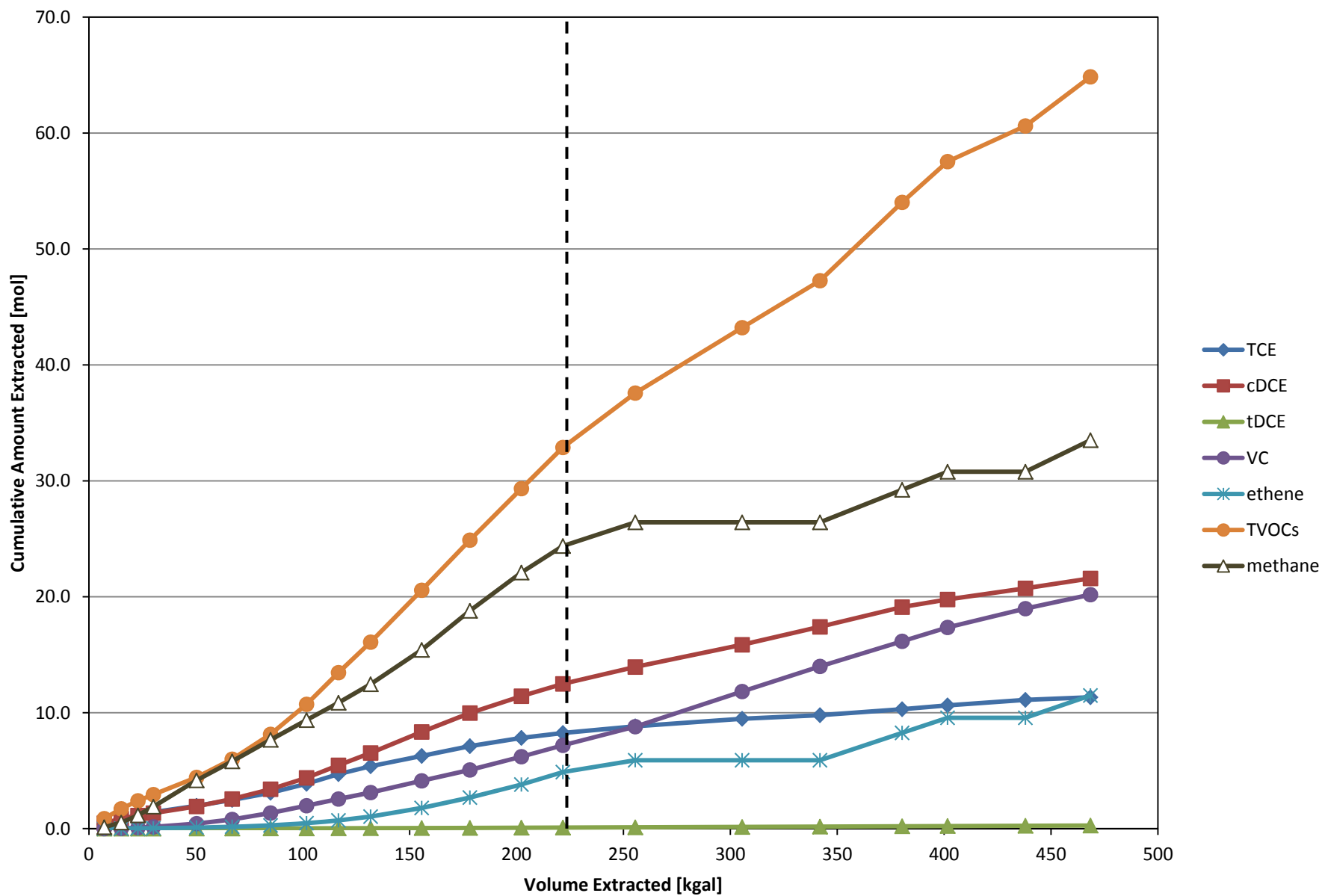


Figure E-5-2. RW0008 Cumulative VOCs Extracted



ATTACHMENT E-6

TREATMENT ZONE VOC MASS ESTIMATES

Table E-6-1 Estimates of VOC Mass in the Treatment Zone over the Operation of the DEM/VAL

Figure E-6-1 Treatment Zone TVOC Mass Estimates over Operation of the DEM/VAL

Table E-6-1. Estimates of VOC Mass in the Treatment Zone over the Operation of the DEM/VAL

	Date	Area (ft ²)	Depth (ft)	Volume (ft ³)	Concentration (µg/L)			Dissolved Mass (kg)				Total Mass (Dissolved & Sorbed) (kg)			
					TCE	cis-1,2-DCE	VC	TCE	cis-1,2-DCE	VC	Total VOCs	TCE	cis-1,2-DCE	VC	Total VOCs
Upper Unit (A, B, and C screened intervals)	Apr-2011	3,469	22	76,318	6,226	35,833	2,814	4.0	23.2	1.8	29.1	7.7	27.8	2.0	37.5
	Aug-2011	3,469	22	76,318	4,355	25,517	3,734	2.8	16.5	2.4	21.8	5.4	19.8	2.7	27.8
	Oct-2011	3,469	22	76,318	1,687	26,733	3,240	1.1	17.3	2.1	20.5	2.1	20.7	2.3	25.1
	Feb-2012	3,469	22	76,318	290	14,582	4,172	0.2	9.4	2.7	12.3	0.4	11.3	3.0	14.6
	Jun-2012	3,469	22	76,318	167	10,886	3,539	0.1	7.1	2.3	9.5	0.2	8.4	2.5	11.2
	Sep-2012	3,469	22	76,318	60	6,393	2,064	0.0	4.1	1.3	5.5	0.1	5.0	1.5	6.5
Middle Units (D screened interval)	Apr-2011	3,469	6	20,814	60,229	6,800	270	10.6	1.2	0.0	11.9	35.8	1.8	0.1	37.7
	Aug-2011	3,469	6	20,814	40,381	6,867	747	7.1	1.2	0.1	8.5	24.0	1.8	0.2	26.0
	Oct-2011	3,469	6	20,814	50,042	7,500	1,933	8.8	1.3	0.3	10.5	29.8	2.0	0.4	32.2
	Feb-2012	3,469	6	20,814	36,686	7,100	3,133	6.5	1.3	0.6	8.3	21.8	1.9	0.7	24.4
	Jun-2012	3,469	6	20,814	21,333	4,287	5,663	3.8	0.8	1.0	5.5	12.7	1.1	1.3	15.1
	Sep-2012	3,469	6	20,814	14,333	4,042	4,230	2.5	0.7	0.7	4.0	8.5	1.1	0.9	10.5
Lower Unit (E and F screened intervals)	Apr-2011	3,469	14	48,566	188	89	12	0.1	0.0	0.0	0.1	0.13	0.04	0.01	0.2
	Aug-2011	3,469	14	48,566	6	414	438	0.0	0.2	0.2	0.4	0.00	0.20	0.20	0.4
	Oct-2011	3,469	14	48,566	267	303	151	0.1	0.1	0.1	0.3	0.19	0.14	0.07	0.4
	Feb-2012	3,469	14	48,566	73	171	382	0.0	0.1	0.2	0.3	0.05	0.08	0.17	0.3
	Jun-2012	3,469	14	48,566	81	132	481	0.0	0.1	0.2	0.3	0.06	0.06	0.21	0.3
	Sep-2012	3,469	14	48,566	9	115	406	0.0	0.0	0.2	0.2	0.01	0.05	0.18	0.2

Estimated Mass in Plume [kg]

	TCE	cis-1,2-DCE	VC	Total VOCs	% Remain	% Removed
Apr-2011	14.8	24.5	1.9	41.1	--	--
Aug-2011	10.0	17.9	2.7	30.6	74%	26%
Oct-2011	10.0	18.8	2.5	31.3	76%	24%
Feb-2012	6.7	10.8	3.4	20.9	51%	49%
Jun-2012	3.9	7.9	3.5	15.3	37%	63%
Sep-2012	2.6	4.9	2.3	9.7	24%	76%

Estimated Mass in Plume [kg], with Retardation

	TCE	cis-1,2-DCE	VC	Total VOCs	% Remain	% Removed
Apr-2011	43.7	29.6	2.1	75.3	--	--
Aug-2011	29.4	21.8	3.0	54.2	72%	28%
Oct-2011	32.0	22.8	2.8	57.7	77%	23%
Feb-2012	22.2	13.3	3.9	39.3	52%	48%
Jun-2012	13.0	9.6	4.0	26.6	35%	65%
Sep-2012	8.6	6.1	2.6	17.3	23%	77%

Estimated Mass Removed [kg]

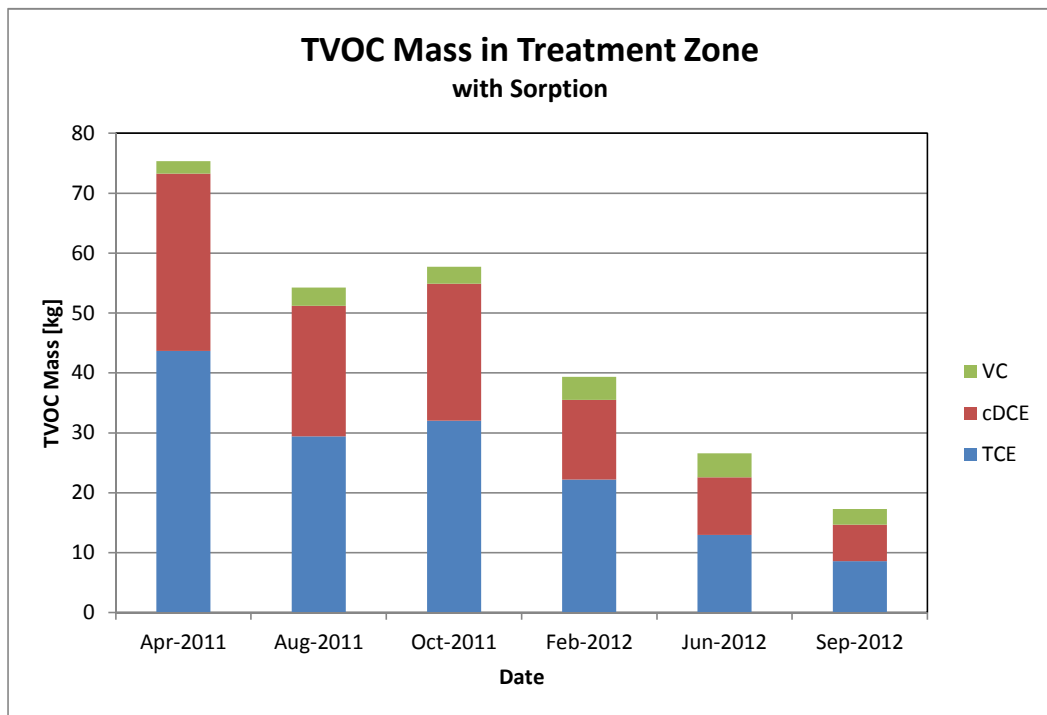
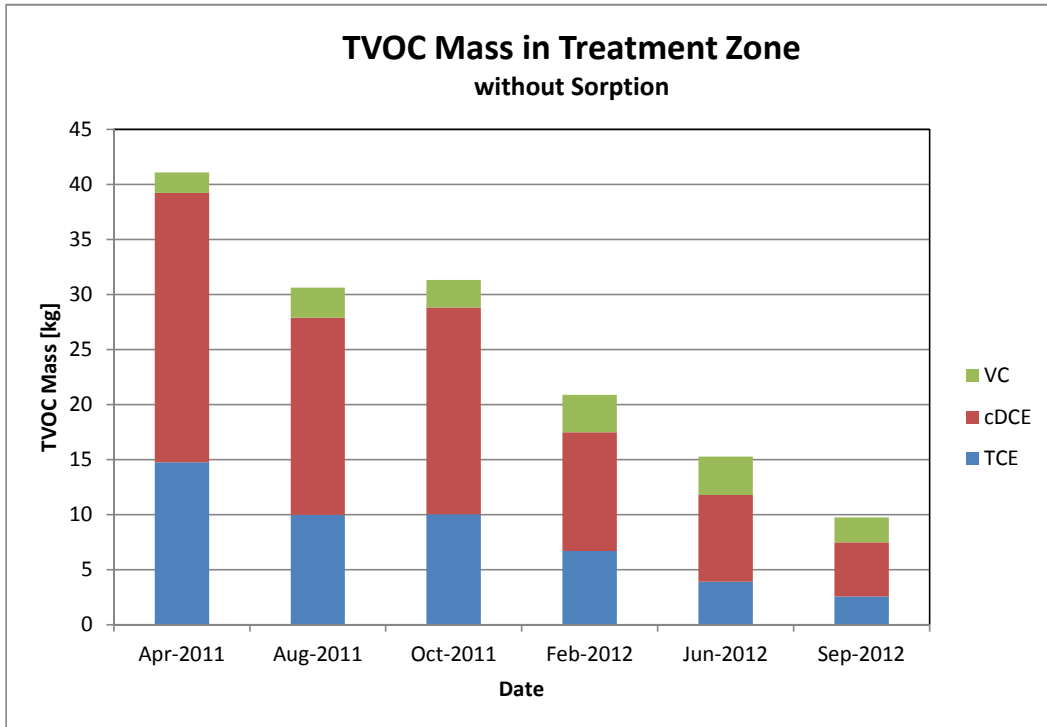
	TCE	cis-1,2-DCE	VC	Total VOCs
Apr-2011	0.0	0.0	0.0	0.0
Aug-2011	4.8	6.5	-0.9	10.5
Oct-2011	4.7	5.7	-0.6	9.8
Feb-2012	8.1	13.7	-1.5	20.2
Jun-2012	10.8	16.6	-1.6	25.8
Sep-2012	12.2	19.6	-0.4	31.4

Estimated Mass Removed [kg], with Retardation

	TCE	cis-1,2-DCE	VC	Total VOCs	Ratio vs No Sorption
Apr-2011	0.0	0.0	0.0	0.0	--
Aug-2011	14.3	7.8	-1.0	21.1	2.0
Oct-2011	11.6	6.8	-0.7	17.6	1.8
Feb-2012	21.4	16.3	-1.8	36.0	1.8
Jun-2012	30.7	20.0	-1.9	48.8	1.9
Sep-2012	35.1	23.5	-0.5	58.1	1.9

	Foc (-)	Bulk Density (g/mL)	Porosity (-)	Retardation Coefficient [R]			
				TCE	cis-1,2-DCE	VC	CFC113
Upper Sand	0.0010	1.65	0.30	1.91	1.20	1.10	3.05
Middle Clay	0.0029	1.50	0.30	3.37	1.51	1.27	6.30
Lower Sand	0.0008	1.65	0.30	1.73	1.16	1.08	2.64
Koc (mL/g)				166	35.5	18.6	372

Figure E-6-1. Treatment Zone TVOC Mass Estimates over Operation of the DEM/VAL



Notes:

1. TVOC mass is estimated as the sum of TCE, cDCE and VC (i.e., does not include CFC113).
2. Mass of each VOC in the treatment zone plume is the sum of the estimated mass in each zone (upper, middle and lower). VOC mass in each zone is estimated using the average VOC concentrations at all monitoring locations in that zone and the volume of groundwater in the zone.
3. TVOC mass with sorption is estimated using compound-specific retardation coefficients for each zone.

APPENDIX F
SAMPLE QA/QC

APPENDIX F

SUMMARY OF SAMPLE QA/QC

F.1 CALIBRATION OF ANALYTICAL EQUIPMENT

All analytical instruments were calibrated by the laboratory as required by the standard USEPA methods or the instrument manufacturer's directions. Calibration verification was conducted at least once per day or for each analytical run. Calibration checks using known standard solutions of the analyte of interest were run as necessary during the day and at the end of each sampling session.

Calibration of field equipment was conducted prior to use. At the beginning of each day that measurements were to be taken, field equipment was calibrated according to the manufacturer's instructions using commercially-prepared standard solutions. Calibration verification was re-checked at the end of the day. All instrument calibration information was recorded in the field records.

F.2 QUALITY ASSURANCE SAMPLING

F.2.1 FIELD QUALITY CONTROL

Quality control (QC) procedures for pH, conductivity, DO, ORP, turbidity and temperature measurements were limited to checking the reproducibility of the measurement by obtaining multiple readings (minimum of 3) on a single sample and by calibrating the instruments according to the manufacturers' specifications.

Field sampling procedures included the preparation and submittal of two types of QC samples from the field and were submitted to the lab as "blind" samples in order not to bias the results:

- **Trip Blank:** One trip blank for every cooler containing samples for VOC analyses was prepared with deionized water, preserved to a pH less than 2 pH units using hydrochloric acid, transported to the site, handled like a sample, and submitted to the laboratory for VOC analysis. Exceptions to this were occasionally made for times when only the two extraction wells were being sampled.
- **Field Duplicates:** Two sets of samples from a source were prepared, labeled with unique sample numbers, and submitted to the laboratory without identifying the samples as duplicates (i.e., without indicating which investigative sample the duplicate represents). Field duplicates were collected as sequential samples; to minimize analyte mass loss, particularly of VOCs, homogenization was not conducted with either water or soil samples. Blind duplicates were collected and analyzed for groundwater samples but not for soil samples due to the inherent difficulty of obtaining identical material. The target

frequency of field duplicate collection was one blind duplicate for every 20 environmental samples collected, for all selected analytes. In practice, this frequency was met or exceeded for all analytes except for the tracer compounds bromide and iodide, for which the achieved frequency was one in 33 (3%).

The results of the analyses of these QC samples were used as independent, external checks on laboratory and field contamination as well as the precision of analyses.

No field blanks or equipment blanks were collected. These samples were considered unnecessary since dedicated sample tubing was used at each monitoring location.

F.2.1.1 Field Quality Control Sample Results

No analytes were detected in any of the trip blanks, indicating there was no cross-contamination during sample storage and transport.

The relative percent difference (RPD; refer to Section 2.4.1 below) for all field duplicates for various analytes are presented in Table F-1. For the majority of analytes, the RPD between field duplicates and parent samples was acceptable ($RPD \leq 30\%$). For VOC analyses, 11% to 37% of the field duplicates had RPDs greater than 30% for the analytes of interest (i.e. 2 to 7 samples out of the 19 field duplicates analyzed, considering TCE, cDCE, tDCE, VC, CFC-113, nBA and n-Butanol). Of the instances where the RPD exceeded 30%, nearly half involved an estimated result for the primary sample, the duplicate, or both. When these instances are discounted, the number of duplicates with RPDs exceeding target was 1 to 5 of the 19 analyzed, depending on which analyte is considered. For the non-VOC analyses, all RPDs were within target with the exception of one chloride result. Although in a few cases the RPD was higher than the target RPD, the results are still considered usable for the purposes of this study and the reported values represent estimated concentrations.

F.2.2 LABORATORY QUALITY CONTROL

Samples were analysed by certified contract laboratories. Laboratory Quality Control samples were routinely analyzed as part of their standard operating procedures. These samples consisted of method blanks, matrix spikes (and matrix spike duplicates), and surrogate and laboratory control samples.

Laboratory QA/QC data did not indicate any major data quality issues. For the majority of cases, there were no detections in method blanks, hold times were met, and LCS/LCSD and MS/MSD recoveries and RPDs were within target ranges. In cases where laboratory QA/QC data were outside of data quality targets, the results are considered usable for the purposes of the study and the reported values represent estimated concentrations.

F.2.2.1 Method Blanks

A method (or preparation) blank was prepared at the frequency specified by the referenced method (typically one per analytical batch). The purpose of the method blank is to ensure that contaminants are not introduced by the glassware, reagents, standards, personnel, or the sample preparation environment.

For volatile analyses, an instrument blank was also analyzed during each calibration shift to verify that contaminants are not being introduced by components of the instrumentation or analytical laboratory.

The laboratory has various routine QC checks in place to verify that new lots of glassware, reagents and standards, decontaminated glassware, sample storage areas (including refrigerators), and water purification systems are contaminant-free.

F.2.2.2 Matrix Spikes and Matrix Spike Duplicates

A matrix spike (MS) is a second, extra aliquot of an environmental sample to which known concentrations of target analytes have been added. The MS is carried through the entire analytical procedure, and the recovery of the analytes is calculated. Results are expressed as percent recovery. The MS is used to evaluate the effect of the sample matrix on the accuracy of the analysis.

A matrix spike duplicate (MSD) is a third, extra aliquot of an environmental sample that is also spiked with the same, known concentrations of analytes used for the MS. The two spiked aliquots are processed separately, and the results are compared to determine the effects of the matrix on the precision and accuracy of the analysis. Results are expressed as relative percent difference (RPD) and percent recovery.

One MS/MSD set was analyzed for every set of investigative samples, for the volatile organic analyses (i.e., VOCs, VFAs and DHGs). The MS/MSD was site-specific and, therefore, field personnel were responsible for collecting additional sample volumes to account for the MS/MSD samples. Similarly, for the other investigative samples collected for inorganic parameter analyses (i.e., tracers, anions, sulfide, alkalinity, dissolved metals, and TOC), laboratory QC involved an MS sample and a duplicate sample to assess the reproducibility (RPD).

F.2.2.3 Surrogate and Laboratory Control Sample Recovery

Surrogate standards were added to each organic sample requiring gas chromatography/mass spectrometer (GC/MS) analysis for VOCs in accordance with the particular method being utilized. In some instances the sample matrix may produce interferences that adversely affect recoveries. Surrogate recoveries were monitored to ensure that they met method acceptance criteria. In addition, laboratory control samples (LCSs) are fortified with spike standard solutions containing target parameters of interest. The recovery of these standards was

quantitatively measured during analysis, and historical records maintained on the percent recovery for each sample.

F.2.3 QUALITY ASSURANCE OBJECTIVES

The data quality indicators (DQIs) for this project were precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). The quality assurance (QA) program addressed both field and laboratory activities. QA objectives for measurement data are expressed in terms of PARCCS. The field QA/QC program was accomplished through the collection of field duplicates and trip blanks. The analytical QA/QC program was assessed through the internal laboratory QC performed, including method blanks, LCS recoveries, surrogate recoveries, and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Data quality acceptance criteria are presented below.

F.2.3.1 Precision

Precision quantifies the repeatability of a given measurement. Precision was determined through the collection of field duplicates and the analysis of MS/MSD samples. Sampling precision was measured through the laboratory analysis of field duplicate samples. Laboratory precision was measured through the analysis of MS/MSD samples, laboratory duplicate samples and laboratory control sample/laboratory control sample duplicates (LCS/LCSD). During the collection of field parameter data, precision was checked by reporting several measurements taken at one location and comparing the results.

Precision was evaluated on the basis of the relative percent difference between duplicate samples for a given analyte. RPD is calculated as follows:

$$RPD(\%) = \frac{C_1 - C_2}{(C_1 + C_2)/2} \times 100$$

where: RPD is relative percent difference, and
C₁ and C₂ are the results of replicate analyses.

A precision goal of RPD ≤ 30% was set for field duplicates for all analytes. For laboratory precision, the precision goal was 30% for organic analytes and 20% for other analytes.

F.2.3.2 Accuracy

Accuracy refers to the degree of difference between measured or calculated values and the true value. Accuracy was evaluated in terms of the percentage of a known amount of analyte or matrix spike recovered from a given matrix. Percent recovery for an analyte was calculated by:

$$\% R = \left(\frac{S - U}{C_{sa}} \right) \times 100$$

where: %R = percent recovery
 S = measured concentration in spiked aliquot
 U = measured concentration in unspiked aliquot
 C_{sa} = actual concentration of spike added.

Accuracy was determined by the percentage of analyte recovered (%R) from the matrix spikes. Matrix spikes for laboratory analyses were prepared by injecting a known mass of a standard solution containing all of the analytes of interest into a groundwater sample, then analyzing the spiked sample according to the appropriate methods. Acceptable ranges for each analyte were as determined by the contract laboratory standard procedure.

The accuracy of field procedures is difficult to assess quantitatively. However, sampling accuracy was maximized by following standard protocols. Equipment and instrumentation was properly calibrated and well-maintained. Trip blanks were included in each sample batch to provide representative data to assess the potential for cross-contamination.

F.2.3.3 Representativeness

Representativeness is the degree to which a sample or group of samples accurately and precisely represents the population being studied. Over the course of this DEM/VAL study, samples were collected in a manner such that they represent both the chemical composition and the physical state of the sample in the groundwater at the time of sampling. Groundwater samples were not collected until field parameter measurements of the purged water had stabilized (generally within the following limits: temperature ± 0.2 °C, pH ± 0.2 standard units, specific conductance ± 5% of reading, DO ± 0.2 mg/L or 10%, whichever was greater, and turbidity ± 5 NTU or 10%, whichever was greater). The sample collection protocol minimized contact with the atmosphere to minimize volatilization.

F.2.3.4 Completeness

Completeness refers to the percentage of valid data received based on completed analysis performed in the laboratory, and is calculated by:

$$\% C = \left(\frac{V}{T} \right) \times 100$$

where: %C = percent completeness
 V = number of measurements judged valid
 T = total number of measurements

The completeness goal was to generate sufficient usable data to assess the technology performance. This was achieved, since all measurements were judged valid and no data were rejected.

F.2.3.5 Comparability

Comparability is the degree to which one data set can be compared to another. To optimize comparability, EPA established methods and approved protocols were selected or specified as appropriate for this DEM/VAL. To ensure comparability, samples were collected at specified intervals and in a similar manner, and were analyzed within required holding times by accepted methods.

F.2.3.6 Sensitivity

Sensitivity refers to the minimum magnitude at which analytical methods can resolve quantitative differences among sample concentrations. The sensitivity of an analytical method is expressed as the method detection limit (MDL), a theoretical concentration limit determined through an MDL study, in which the concentration of a spiked solution is tested at least 7 times. The standard deviation of the recovered concentrations (σ_{rec}) is computed and multiplied by the Student's t-distribution value to arrive at the MDL. In practice, to allow for matrix interferences and variability in instrument control, a reporting limit of 2.5 to 5 times the MDL is typically selected.

The MDL for all measurements is calculated according to:

$$MDL = t_{(n-1, 1-\alpha=0.99)} \times S$$

where: s = standard deviation of replicate analyses of matrix spikes with concentrations near the MDL
 $t(n-1, 1-\alpha = 0.99) =$ Students' t value for a one-sided, 99% confidence level and a standard deviation estimate with n-1 degrees of freedom.

F.3 DECONTAMINATION PROCEDURES

All sampling and field equipment received routine testing, inspection and maintenance checks to minimize equipment breakdown and ensure proper function. Routine daily maintenance conducted in the field included:

- Remove surface dirt and debris from the exposed surfaces of all equipment;
- Store equipment away from the elements;
- Inspect equipment and instruments for possible problems daily, including cracked or clogged lines or tubing, weak batteries, and worn pump heads; and

- Charge any equipment battery packs when not in use.

Cleaning of non-dedicated and non-disposable field sampling and measuring equipment and personal protective equipment (PPE) was performed to minimize the potential for cross-contamination between sample locations and samples, and to minimize the potential for exposure of workers to Site-related chemicals. All sampling devices and reusable PPE were decontaminated immediately after each use with direct application of a phosphate-free soap solution (i.e. Alconox™), followed by rinsing with distilled water. Expended decontamination fluids were containerized by the sampling personnel for disposal by NASA. Non-reusable sampling equipment, gloves, and tubing were disposed of appropriately following each sampling event.

F.4 SAMPLE DOCUMENTATION

Data management involved maintaining and controlling field data, laboratory analytical data, and any other data relevant to the project. Field data was recorded on designated forms or logs. Data entries included date and time. Sample collection data as well as visual observations were documented on specific forms and/or daily field notes. The sample collection equipment and field instruments were identified in the field documentation. Calculations, results, equipment usage, maintenance, repair and calibration data for field sampling, and field analytical and field physical measurement equipment was also recorded in field documentation. Once completed, the field forms were incorporated into the project file.

Sample collection and sample custody procedures were designed to ensure that custody of field samples was maintained and documented. These procedures provide identification and documentation of the sampling event and the sample chain-of-custody from shipment of sample bottleware, through sample collection, to receipt of the sample by the subcontracted laboratory. When used in conjunction with the laboratory's custody procedures and the sample bottleware documentation, these data establish full legal custody and allow complete tracking of a sample from preparation and receipt of sample bottleware to sample collection, preservation, and shipping through laboratory receipt, sample analysis and data validation.

A sample was in custody if:

- it was in the field investigator's, transferee's, or lab technician's actual possession; or
- it was the field investigator's, transferee's, or lab technician's view, after being in his/her physical possession; or
- it was in the field investigator's, transferee's, or lab technician's physical possession and then he/she secured it to prevent tampering; or
- it was placed in a designated secure area.

Prior to each sample collection event, each sample container had a self-adhesive, non-removable sample label affixed. As samples were collected, all sample containers were labeled with an

identification number that uniquely identified the sample. The sample identification number was logged in the field forms along with the following information about the sampling event:

1. Sampling personnel
2. Date and time of collection
3. Field sample location and depth (if appropriate)
4. Observations on ambient conditions
5. Type of sample (composite or grab)
6. Method of sampling
7. Sampling matrix or source
8. Results of field screening
9. Intended analyses

Sample labels contained the following information:

- Site name;
- Project number;
- A unique sample identification number;
- Date and time of sample collection;
- Analysis to be performed; and
- Preservation chemical (if applicable).

Sample identifiers (IDs) consisted of the sample location name and sample collection depth (as appropriate), as well as the date of sample collection. Field duplicate samples required special procedures for sample designation to ensure that they were submitted blindly to the laboratory. A fictitious sample ID and time was used on the submitted sample, with both the fictitious and actual information documented in the standard field forms.

All samples were stored in an insulated cooler containing ice packs or ice sealed in a plastic bag. Samples selected for laboratory analysis were transferred to insulated coolers for overnight shipment to the laboratory. Each cooler was packed in a manner that prevented damage to sample containers during shipment and contained a sufficient amount of ice or ice packs to ensure that the temperature was maintained between approximately 0°C and 4°C.

A Chain-of-Custody Record (COC) accompanied each cooler and was used to trace the possession and handling of all samples, from their collection, through analysis, until their final disposition. The Chain-of-Custody Record documented the names of the relinquishing and receiving parties, the time and date of the transfer of custody, and the reason for the transfer of custody. One COC accompanied each cooler shipped to the laboratory. The form was placed in a sealed plastic bag inside the cooler, typically taped to the inside lid of the cooler. Following packing, the cooler lid was sealed with strapping tape. A custody seal was signed, dated and affixed from the cooler lid to the cooler body and was additionally covered with clear tape; thus ensuring that tampering with the cooler contents would be immediately evident. The sample

coolers were typically shipped by overnight express courier to the laboratory. A copy of the COC and bill of lading were retained. Each sample shipment was tracked via the courier waybill number to ensure that prompt delivery of the shipment to the laboratory occurred.

TABLE F-1
RELATIVE PERCENT DIFFERENCE IN FIELD DUPLICATES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	0.4 U	0.4 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	8200	7100	14.4
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	6500	11000	51.4
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	11000	9800	11.5
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	10 U	10 U	NC
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	0.4 U	0.4 U	NC
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	96 I	220 I	78.5
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	20 U	20 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	8500	8700	2.3
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	160	180	11.8
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	87000	120000	31.9
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	32000	39000	19.7
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	9400	16000	52.0
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	2900	4100	34.3
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	2900	3500	18.8
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	3.2 I	2.2 I	37.0
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	16 U	16 U	NC
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	0.31 U	0.78 U	NC
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	1,1,2-TRICHLOROTRIFLUOROETHANE	µg/L	5600	9500	51.7
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	1-BUTANOL	µg/L	6.7 U	6.7 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	1-BUTANOL	µg/L	1400 U	1400 U	NC
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	1-BUTANOL	µg/L	1700 U	340 U	NC
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	1-BUTANOL	µg/L	1700 U	1700 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	1-BUTANOL	µg/L	170 U	170 U	NC
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	1-BUTANOL	µg/L	6.7 U	6.7 U	NC
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	1-BUTANOL	µg/L	670 U	670 U	NC
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	1-BUTANOL	µg/L	340 U	340 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	1-BUTANOL	µg/L	1700 U	1400 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	1-BUTANOL	µg/L	67 U	67 U	NC
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	1-BUTANOL	µg/L	5300 U	49000 I	NC
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	1-BUTANOL	µg/L	15000 I	22000 I	37.8
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	1-BUTANOL	µg/L	630000	590000	6.6
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	1-BUTANOL	µg/L	180000	230000	24.4
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	1-BUTANOL	µg/L	180000	240000	28.6
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	1-BUTANOL	µg/L	63 I,V	220 I	111.0
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	1-BUTANOL	µg/L	530 U	4300 I	NC
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	1-BUTANOL	µg/L	11 U	27 U	NC
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	1-BUTANOL	µg/L	530 U	530 U	NC

TABLE F-1
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Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-02	ACETIC ACID	MG/L	2.4	2.4	0.0
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-09	ACETIC ACID	MG/L	3.3	3.3	0.0
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	ACETIC ACID	MG/L	22	22	0.0
LC34-IW0002D	1-Aug-11	35 - 40	LC34-IW0002D-037.5-20110801	LC34-IW0002D-037.5-20110801-D	ACETIC ACID	MG/L	1100	1100	0.0
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-FD-20110801-06	ACETIC ACID	MG/L	610	620	1.6
LC34-BW0003D	2-Aug-11	44 - 47	LC34-BW0003D-045.5-20110802	LC34-FD-20110802-08	ACETIC ACID	MG/L	640	620	3.2
LC34-IW0002I	15-Feb-12	25 - 30	LC34-IW0002I-027.5-20120215	LC34-FD-20120215-03	ACETIC ACID	MG/L	3.6	3.7	2.7
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	ALKALINITY	MG/L	223	221	0.9
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-07	ALKALINITY	MG/L	173	171	1.2
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-BW0001D-045.5-20110801-D	ALKALINITY	MG/L	250	245	2.0
LC34-BW0003C	2-Aug-11	37 - 40	LC34-BW0003C-038.5-20110802	LC34-FD-20110802-04	ALKALINITY	MG/L	760	746	1.9
LC34-BW0003C	15-Feb-12	37 - 40	LC34-BW0003C-038.5-20120215	LC34-FD-20120215-02	ALKALINITY	MG/L	308	310	0.6
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	ARSENIC	µg/L	4 U	4 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-08	ARSENIC	µg/L	4 U	4 U	NC
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	ARSENIC	µg/L	2 U	2 U	NC
LC34-IW0076	1-Aug-11	70 - 80	LC34-IW0076-075.0-20110801	LC34-FD-20110801-08	ARSENIC	µg/L	2 U	2 U	NC
LC34-RW0008	14-Feb-12	47.5 - 57	LC34-RW0008-052.0-20120214	LC34-FD-20120214-02	ARSENIC	µg/L	10 U	10 U	NC
LC34-BW0001B	1-Aug-11	30 - 33	LC34-BW0001B-031.5-20110801	LC34-BW0001B-031.5-20110801-D	BROMIDE	MG/L	0.6 U	0.6 U	NC
LC34-BW0001F	1-Aug-11	58 - 61	LC34-BW0001F-059.5-20110801	LC34-FD-20110801-09	BROMIDE	MG/L	26.9	20.5	27.0
LC34-BW0002A	2-Aug-11	23 - 26	LC34-BW0002A-024.5-20110802	LC34-FD-20110802-05	BROMIDE	MG/L	0.6 U	0.6 U	NC
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-FD-20110802-06	BROMIDE	MG/L	1.1	1	9.5
LC34-BW0001C	16-Feb-12	37 - 40	LC34-BW0001C-038.5-20120216	LC34-FD-20120216-03	BROMIDE	MG/L	29.3	36.6	22.2
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-02	BUTANOIC ACID	MG/L	0.56 U	0.56 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-09	BUTANOIC ACID	MG/L	0.56 U	0.56 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	BUTANOIC ACID	MG/L	0.56 U	0.56 U	NC
LC34-IW0002D	1-Aug-11	35 - 40	LC34-IW0002D-037.5-20110801	LC34-IW0002D-037.5-20110801-D	BUTANOIC ACID	MG/L	1200	1200	0.0
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-FD-20110801-06	BUTANOIC ACID	MG/L	210	200	4.9
LC34-BW0003D	2-Aug-11	44 - 47	LC34-BW0003D-045.5-20110802	LC34-FD-20110802-08	BUTANOIC ACID	MG/L	320	310	3.2
LC34-IW0002I	15-Feb-12	25 - 30	LC34-IW0002I-027.5-20120215	LC34-FD-20120215-03	BUTANOIC ACID	MG/L	0.56 U	0.56 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-04	CARBON	MG/L	4	4	0.0
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-FD-20110419-12	CARBON	MG/L	3.3	3.2	3.1
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	CARBON	MG/L	4.4	4.5	2.2
LC34-BW0001C	1-Aug-11	37 - 40	LC34-BW0001C-038.5-20110801	LC34-FD-20110801-02	CARBON	MG/L	301	304	1.0
LC34-BW0002B	2-Aug-11	30 - 33	LC34-BW0002B-031.5-20110802	LC34-FD-20110802-03	CARBON	MG/L	12.9	13.8	6.7
LC34-BW0003B	2-Aug-11	30 - 33	LC34-BW0003B-031.5-20110802	LC34-BW0003B-031.5-20110802-D	CARBON	MG/L	89	99	10.6
LC34-BW0001A	16-Feb-12	23 - 26	LC34-BW0001A-024.5-20120216	LC34-FD-20120216-01	CARBON	MG/L	2.8	3	6.9
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	CHLORIDE	MG/L	642	645	0.5
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-06	CHLORIDE	MG/L	675	648	4.1
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-RW0008-052.0-20110801-D	CHLORIDE	MG/L	602	629	4.4
LC34-BW0002C	2-Aug-11	37 - 40	LC34-BW0002C-038.5-20110802	LC34-FD-20110802-01	CHLORIDE	MG/L	539	53.2	164.1
LC34-BW0002C	14-Feb-12	37 - 40	LC34-BW0002C-038.5-20120214	LC34-FD-20120214-03	CHLORIDE	MG/L	50.5	46.8	7.6

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Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	CIS-1,2-DICHLOROETHENE	µg/L	0.62 I	1.5 I	83.0
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	CIS-1,2-DICHLOROETHENE	µg/L	31000	32000	3.2
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	CIS-1,2-DICHLOROETHENE	µg/L	28000	25000	11.3
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	CIS-1,2-DICHLOROETHENE	µg/L	41000	38000	7.6
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	CIS-1,2-DICHLOROETHENE	µg/L	7500	7900	5.2
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	CIS-1,2-DICHLOROETHENE	µg/L	80	58	31.9
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	CIS-1,2-DICHLOROETHENE	µg/L	46000	52000	12.2
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	CIS-1,2-DICHLOROETHENE	µg/L	6800	5700	17.6
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	CIS-1,2-DICHLOROETHENE	µg/L	25000	23000	8.3
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	CIS-1,2-DICHLOROETHENE	µg/L	510	500	2.0
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	CIS-1,2-DICHLOROETHENE	µg/L	36000	39000	8.0
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	CIS-1,2-DICHLOROETHENE	µg/L	4300 I	5900	31.4
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	CIS-1,2-DICHLOROETHENE	µg/L	13000	14000	7.4
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	CIS-1,2-DICHLOROETHENE	µg/L	31000	36000	14.9
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	CIS-1,2-DICHLOROETHENE	µg/L	31000	36000	14.9
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	CIS-1,2-DICHLOROETHENE	µg/L	55	47	15.7
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	CIS-1,2-DICHLOROETHENE	µg/L	8800	8100	8.3
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	CIS-1,2-DICHLOROETHENE	µg/L	150	100	40.0
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	CIS-1,2-DICHLOROETHENE	µg/L	8900	9100	2.2
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-03	ETHANE	µg/L	0.29 U	0.29 U	NC
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-FD-20110419-11	ETHANE	µg/L	0.29 U	0.29 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	ETHANE	µg/L	0.29 U	0.29 U	NC
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	ETHANE	µg/L	20	22	9.5
LC34-BW0003A	2-Aug-11	23 - 26	LC34-BW0003A-024.5-20110802	LC34-FD-20110802-07	ETHANE	µg/L	12	12	0.0
LC34-BW0003F	2-Aug-11	58 - 61	LC34-BW0003F-059.5-20110802	LC34-FD-20110802-02	ETHANE	µg/L	0.29 U	0.29 U	NC
LC34-BW0002A	15-Feb-12	23 - 26	LC34-BW0002A-024.5-20120215	LC34-FD-20120215-01	ETHANE	µg/L	98	96	2.1
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-03	ETHENE	µg/L	33	32	3.1
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-FD-20110419-11	ETHENE	µg/L	4.5	4.3	4.5
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	ETHENE	µg/L	11	11	0.0
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	ETHENE	µg/L	29	31	6.7
LC34-BW0003A	2-Aug-11	23 - 26	LC34-BW0003A-024.5-20110802	LC34-FD-20110802-07	ETHENE	µg/L	240	250	4.1
LC34-BW0003F	2-Aug-11	58 - 61	LC34-BW0003F-059.5-20110802	LC34-FD-20110802-02	ETHENE	µg/L	0.3 U	0.3 U	NC
LC34-BW0002A	15-Feb-12	23 - 26	LC34-BW0002A-024.5-20120215	LC34-FD-20120215-01	ETHENE	µg/L	140	150	6.9
LC34-BW0001B	1-Aug-11	30 - 33	LC34-BW0001B-031.5-20110801	LC34-BW0001B-031.5-20110801-D	IODIDE	MG/L	0.2 U	0.2 U	NC
LC34-BW0001F	1-Aug-11	58 - 61	LC34-BW0001F-059.5-20110801	LC34-FD-20110801-09	IODIDE	MG/L	0.2 U	0.2 U	NC
LC34-BW0002A	2-Aug-11	23 - 26	LC34-BW0002A-024.5-20110802	LC34-FD-20110802-05	IODIDE	MG/L	0.2 U	0.2 U	NC
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-FD-20110802-06	IODIDE	MG/L	0.2 U	0.2 U	NC
LC34-BW0001C	16-Feb-12	37 - 40	LC34-BW0001C-038.5-20120216	LC34-FD-20120216-03	IODIDE	MG/L	40.7	0.2 U	NC

TABLE F-1
RELATIVE PERCENT DIFFERENCE IN FIELD DUPLICATES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	IRON	µg/L	120	60 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-08	IRON	µg/L	120	60 U	NC
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	IRON	µg/L	20 U	20 U	NC
LC34-IW0076	1-Aug-11	70 - 80	LC34-IW0076-075.0-20110801	LC34-FD-20110801-08	IRON	µg/L	20 U	20 U	NC
LC34-RW0008	14-Feb-12	47.5 - 57	LC34-RW0008-052.0-20120214	LC34-FD-20120214-02	IRON	µg/L	100 U	100 U	NC
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-02	LACTIC ACID	MG/L	0.072 U	0.072 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-09	LACTIC ACID	MG/L	0.072 U	0.072 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	LACTIC ACID	MG/L	0.072 U	0.072 U	NC
LC34-IW0002D	1-Aug-11	35 - 40	LC34-IW0002D-037.5-20110801	LC34-IW0002D-037.5-20110801-D	LACTIC ACID	MG/L	0.72 U	0.72 U	NC
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-FD-20110801-06	LACTIC ACID	MG/L	0.36 U	0.36 U	NC
LC34-BW0003D	2-Aug-11	44 - 47	LC34-BW0003D-045.5-20110802	LC34-FD-20110802-08	LACTIC ACID	MG/L	0.36 U	0.36 U	NC
LC34-IW0002I	15-Feb-12	25 - 30	LC34-IW0002I-027.5-20120215	LC34-FD-20120215-03	LACTIC ACID	MG/L	0.072 U	0.072 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	MANGANESE	µg/L	10	2 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-08	MANGANESE	µg/L	15	14	6.9
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	MANGANESE	µg/L	60	59	1.7
LC34-IW0076	1-Aug-11	70 - 80	LC34-IW0076-075.0-20110801	LC34-FD-20110801-08	MANGANESE	µg/L	2 U	10	NC
LC34-RW0008	14-Feb-12	47.5 - 57	LC34-RW0008-052.0-20120214	LC34-FD-20120214-02	MANGANESE	µg/L	12	12	0.0
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-03	METHANE	µg/L	75	80	6.5
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-FD-20110419-11	METHANE	µg/L	44	43	2.3
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	METHANE	µg/L	47	47	0.0
LC34-IW0002D1	1-Aug-11	50 - 55	LC34-IW0002D1-052.5-20110801	LC34-IW0002D1-052.5-20110801-D	METHANE	µg/L	5600	5800	3.5
LC34-BW0003A	2-Aug-11	23 - 26	LC34-BW0003A-024.5-20110802	LC34-FD-20110802-07	METHANE	µg/L	110	110	0.0
LC34-BW0003F	2-Aug-11	58 - 61	LC34-BW0003F-059.5-20110802	LC34-FD-20110802-02	METHANE	µg/L	750	850	12.5
LC34-BW0002A	15-Feb-12	23 - 26	LC34-BW0002A-024.5-20120215	LC34-FD-20120215-01	METHANE	µg/L	410	410	0.0
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	N-BUTYL ACETATE	µg/L	0.3 U	0.3 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	N-BUTYL ACETATE	µg/L	60 U	60 U	NC
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	N-BUTYL ACETATE	µg/L	75 U	15 U	NC
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	N-BUTYL ACETATE	µg/L	75 U	75 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	N-BUTYL ACETATE	µg/L	7.5 U	7.5 U	NC
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	N-BUTYL ACETATE	µg/L	0.3 U	0.3 U	NC
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	N-BUTYL ACETATE	µg/L	30 U	30 U	NC
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	N-BUTYL ACETATE	µg/L	15 U	15 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	N-BUTYL ACETATE	µg/L	75 U	60 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	N-BUTYL ACETATE	µg/L	3 U	3 U	NC
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	N-BUTYL ACETATE	µg/L	340 I	670 I	65.3
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	N-BUTYL ACETATE	µg/L	7100	8400	16.8
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	N-BUTYL ACETATE	µg/L	11000	33000	100.0
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	N-BUTYL ACETATE	µg/L	53 U	130 I	NC
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	N-BUTYL ACETATE	µg/L	53 U	170 I	NC
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	N-BUTYL ACETATE	µg/L	4 I	4.3 I	7.2
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	N-BUTYL ACETATE	µg/L	86 I	81 I	6.0
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	N-BUTYL ACETATE	µg/L	0.41 I	0.53 U	NC
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	N-BUTYL ACETATE	µg/L	11 U	11 U	NC

TABLE F-1
RELATIVE PERCENT DIFFERENCE IN FIELD DUPLICATES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	NITRATE-N	MG/L	0.07 U	0.07 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-06	NITRATE-N	MG/L	0.07 U	0.07 U	NC
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-RW0008-052.0-20110801-D	NITRATE-N	MG/L	0.2 U	0.2 U	NC
LC34-BW0002C	2-Aug-11	37 - 40	LC34-BW0002C-038.5-20110802	LC34-FD-20110802-01	NITRATE-N	MG/L	0.2 U	0.2 U	NC
LC34-BW0002C	14-Feb-12	37 - 40	LC34-BW0002C-038.5-20120214	LC34-FD-20120214-03	NITRATE-N	MG/L	0.2 U	0.2 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	NITRITE-N	MG/L	0.9 U	0.9 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-06	NITRITE-N	MG/L	0.9 U	0.9 U	NC
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-RW0008-052.0-20110801-D	NITRITE-N	MG/L	2 U	1 U	NC
LC34-BW0002C	2-Aug-11	37 - 40	LC34-BW0002C-038.5-20110802	LC34-FD-20110802-01	NITRITE-N	MG/L	1 U	0.1 U	NC
LC34-BW0002C	14-Feb-12	37 - 40	LC34-BW0002C-038.5-20120214	LC34-FD-20120214-03	NITRITE-N	MG/L	0.004 U	0.004 U	NC
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-02	PROPIONIC ACID	MG/L	0.13 U	0.13 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-09	PROPIONIC ACID	MG/L	0.13 U	0.13 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	PROPIONIC ACID	MG/L	0.13 U	0.13 U	NC
LC34-IW0002D	1-Aug-11	35 - 40	LC34-IW0002D-037.5-20110801	LC34-IW0002D-037.5-20110801-D	PROPIONIC ACID	MG/L	11	1.3 U	NC
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-FD-20110801-06	PROPIONIC ACID	MG/L	0.64 U	0.64 U	NC
LC34-BW0003D	2-Aug-11	44 - 47	LC34-BW0003D-045.5-20110802	LC34-FD-20110802-08	PROPIONIC ACID	MG/L	0.64 U	0.64 U	NC
LC34-IW0002I	15-Feb-12	25 - 30	LC34-IW0002I-027.5-20120215	LC34-FD-20120215-03	PROPIONIC ACID	MG/L	0.13 U	0.13 U	NC
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-02	PYRUVIC ACID	MG/L	0.018 U	0.018 U	NC
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-09	PYRUVIC ACID	MG/L	0.018 U	0.018 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	PYRUVIC ACID	MG/L	0.018 U	0.018 U	NC
LC34-IW0002D	1-Aug-11	35 - 40	LC34-IW0002D-037.5-20110801	LC34-IW0002D-037.5-20110801-D	PYRUVIC ACID	MG/L	0.18 U	0.18 U	NC
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-FD-20110801-06	PYRUVIC ACID	MG/L	0.09 U	0.09 U	NC
LC34-BW0003D	2-Aug-11	44 - 47	LC34-BW0003D-045.5-20110802	LC34-FD-20110802-08	PYRUVIC ACID	MG/L	0.09 U	0.09 U	NC
LC34-IW0002I	15-Feb-12	25 - 30	LC34-IW0002I-027.5-20120215	LC34-FD-20120215-03	PYRUVIC ACID	MG/L	0.018 U	0.018 U	NC
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	SULFATE	MG/L	61.2	60.5	1.2
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-06	SULFATE	MG/L	92.4	92.3	0.1
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-RW0008-052.0-20110801-D	SULFATE	MG/L	0.5 U	0.5 U	NC
LC34-BW0002C	2-Aug-11	37 - 40	LC34-BW0002C-038.5-20110802	LC34-FD-20110802-01	SULFATE	MG/L	0.5 U	0.5 U	NC
LC34-BW0002C	14-Feb-12	37 - 40	LC34-BW0002C-038.5-20120214	LC34-FD-20120214-03	SULFATE	MG/L	26.2	25.9	1.2
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	SULFIDE	MG/L	1	0.48 U	NC
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-FD-20110419-05	SULFIDE	MG/L	0.5 U	0.48 U	NC
LC34-BW0001E	1-Aug-11	51 - 54	LC34-BW0001E-052.5-20110801	LC34-FD-20110801-07	SULFIDE	MG/L	1.5	1.5	0.0
LC34-BW0003C	2-Aug-11	37 - 40	LC34-BW0003C-038.5-20110802	LC34-BW0003C-038.5-20110802-D	SULFIDE	MG/L	14.6	14.7	0.7
LC34-BW0001B	16-Feb-12	30 - 33	LC34-BW0001B-031.5-20120216	LC34-FD-20120216-02	SULFIDE	MG/L	3.4	3.2	6.1
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	TRANS-1,2-DICHLOROETHENE	µg/L	0.3 U	0.3 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	TRANS-1,2-DICHLOROETHENE	µg/L	200 I	200 I	0.0
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	TRANS-1,2-DICHLOROETHENE	µg/L	360 I	380	5.4
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	TRANS-1,2-DICHLOROETHENE	µg/L	820 I	790 I	3.7
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	TRANS-1,2-DICHLOROETHENE	µg/L	49 I	49 I	0.0
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	TRANS-1,2-DICHLOROETHENE	µg/L	2.1 I	1.4 I	40.0
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	TRANS-1,2-DICHLOROETHENE	µg/L	600	1000	50.0
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	TRANS-1,2-DICHLOROETHENE	µg/L	33 I	27 I	20.0
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	TRANS-1,2-DICHLOROETHENE	µg/L	170 I	160 I	6.1

TABLE F-1
RELATIVE PERCENT DIFFERENCE IN FIELD DUPLICATES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	TRANS-1,2-DICHLOROETHENE	µg/L	3 I	3.3 I	9.5
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	TRANS-1,2-DICHLOROETHENE	µg/L	690 I	680 I	1.5
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	TRANS-1,2-DICHLOROETHENE	µg/L	200 U	200 U	NC
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	TRANS-1,2-DICHLOROETHENE	µg/L	220 I	260 I	16.7
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	TRANS-1,2-DICHLOROETHENE	µg/L	130 I	130 I	0.0
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	TRANS-1,2-DICHLOROETHENE	µg/L	130 I	130 I	0.0
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	TRANS-1,2-DICHLOROETHENE	µg/L	19	17	11.1
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	TRANS-1,2-DICHLOROETHENE	µg/L	59 I	63 I	6.6
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	TRANS-1,2-DICHLOROETHENE	µg/L	4.6 I	2.7 I	52.1
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	TRANS-1,2-DICHLOROETHENE	µg/L	250 I	210 I	17.4
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	TRICHLOROETHENE	µg/L	0.3 U	0.3 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	TRICHLOROETHENE	µg/L	17000	16000	6.1
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	TRICHLOROETHENE	µg/L	1100 I	350	103.4
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	TRICHLOROETHENE	µg/L	140 I	140 I	0.0
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	TRICHLOROETHENE	µg/L	38 I	44 I	14.6
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	TRICHLOROETHENE	µg/L	4.7 I	5.3	12.0
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	TRICHLOROETHENE	µg/L	30 U	30 U	NC
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	TRICHLOROETHENE	µg/L	650	500	26.1
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	TRICHLOROETHENE	µg/L	12000	12000	0.0
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	TRICHLOROETHENE	µg/L	1000	1100	9.5
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	TRICHLOROETHENE	µg/L	300 I	470 I	44.2
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	TRICHLOROETHENE	µg/L	120000	170000	34.5
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	TRICHLOROETHENE	µg/L	280 I	310 I	10.2
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	TRICHLOROETHENE	µg/L	2400	3300	31.6
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	TRICHLOROETHENE	µg/L	2400	2800	15.4
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	TRICHLOROETHENE	µg/L	3.5 I	3.2 I	9.0
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	TRICHLOROETHENE	µg/L	43 I	41 I	4.8
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	TRICHLOROETHENE	µg/L	5.1	2.1 I	83.3
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	TRICHLOROETHENE	µg/L	560	1100	65.1
LC34-BW0003E	22-Mar-11	51 - 54	LC34-BW0003E-052.5-20110322	LC34-FD-20110322-01	VINYL CHLORIDE	µg/L	0.3 U	0.3 U	NC
LC34-RW0007	28-Mar-11	35.25 - 41.85	LC34-RW0007-038.5-20110328	LC34-FD-20110328-01	VINYL CHLORIDE	µg/L	740 I	810 I	9.0
LC34-IW0002D	7-Apr-11	35 - 40	LC34-IW0002D-037.5-20110407	LC34-FD-20110407-01	VINYL CHLORIDE	µg/L	2800	810	110.2
LC34-BW0002A	19-Apr-11	23 - 26	LC34-BW0002A-024.5-20110419	LC34-FD-20110419-01	VINYL CHLORIDE	µg/L	1900	1800	5.4
LC34-BW0002D	19-Apr-11	44 - 47	LC34-BW0002D-045.5-20110419	LC34-FD-20110419-10	VINYL CHLORIDE	µg/L	410	360	13.0
LC34-BW0002F	19-Apr-11	58 - 61	LC34-BW0002F-059.5-20110419	LC34-FD-20110419-13	VINYL CHLORIDE	µg/L	67	38	55.2
LC34-BW0003B	19-Apr-11	30 - 33	LC34-BW0003B-031.5-20110419	LC34-BW0003B-031.5-20110419-D	VINYL CHLORIDE	µg/L	5500	9500	53.3
LC34-BW0003D	19-Apr-11	44 - 47	LC34-BW0003D-045.5-20110419	LC34-BW0003D-045.5-20110419-D	VINYL CHLORIDE	µg/L	400	340	16.2
LC34-RW0007	19-Apr-11	35.25 - 41.85	LC34-RW0007-038.5-20110419	LC34-RW0007-038.5-20110419-D	VINYL CHLORIDE	µg/L	990 I	900 I	9.5
LC34-RW0008	19-Apr-11	47.5 - 57	LC34-RW0008-052.0-20110419	LC34-RW0008-052.0-20110419-D	VINYL CHLORIDE	µg/L	24 I	23 I	4.3
LC34-BW0001A	1-Aug-11	23 - 26	LC34-BW0001A-024.5-20110801	LC34-FD-20110801-04	VINYL CHLORIDE	µg/L	4000	5200	26.1
LC34-BW0001D	1-Aug-11	44 - 47	LC34-BW0001D-045.5-20110801	LC34-FD-20110801-05	VINYL CHLORIDE	µg/L	230 U	230 U	NC
LC34-IW0002I	1-Aug-11	25 - 30	LC34-IW0002I-027.5-20110801	LC34-IW0002I-027.5-20110801-D	VINYL CHLORIDE	µg/L	270 I	370 I	31.3
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-FD-20110801-03	VINYL CHLORIDE	µg/L	770 I	850 I	9.9

TABLE F-1
RELATIVE PERCENT DIFFERENCE IN FIELD DUPLICATES
Hot Spot 1, LC34, CCAFS / ESTCP Project ER-0716

Location	Sample Date	Depth Interval (ft BLS)	Parent Sample ID	Field Duplicate Sample ID	Parameter	Units	Parent Sample Result	Field Duplicate Sample Result	RPD
LC34-RW0007	1-Aug-11	35.25 - 41.85	LC34-RW0007-038.5-20110801	LC34-RW0007-038.5-20110801-D	VINYL CHLORIDE	µg/L	770 I	810 I	5.1
LC34-RW0008	1-Aug-11	47.5 - 57	LC34-RW0008-052.0-20110801	LC34-FD-20110801-01	VINYL CHLORIDE	µg/L	2600	2900	10.9
LC34-BW0002D	2-Aug-11	44 - 47	LC34-BW0002D-045.5-20110802	LC34-BW0002D-045.5-20110802-D	VINYL CHLORIDE	µg/L	1500	1100	30.8
LC34-BW0002F	2-Aug-11	58 - 61	LC34-BW0002F-059.5-20110802	LC34-BW0002F-059.5-20110802-D	VINYL CHLORIDE	µg/L	440	370	17.3
LC34-RW0007	14-Feb-12	35.25 - 41.85	LC34-RW0007-038.5-20120214	LC34-FD-20120214-01	VINYL CHLORIDE	µg/L	6400	7600	17.1

Notes:

1. ft BLS indicates feet below land surface.
2. µg/L indicates micrograms per liter.
3. MG/L indicates milligrams per liter.
4. U indicates result not detected above practical quantitation limit (PQL)
5. I indicates the result is between the method detection limit (MDL) and the PQL.
6. V indicates analyte was detected in both the sample and the associated method blank
7. NC indicates not calculated.
8. RPD indicates relative percent difference
9. **Bold** indicates the result was detected above the MDL.
10. Results not displayed to a set number of significant digits.

APPENDIX G
LABORATORY REPORTS

February 11, 2011

Service Request No: R1100415

Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34

Dear Cory:

Enclosed are the results of the sample(s) submitted to our laboratory on January 21, 2011. For your reference, these analyses have been assigned our service request number **R1100415**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 28

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1100415

<u>Lab ID</u>	<u>Client ID</u>
R1100415-001	LC34-SB1003-028.0-20110119
R1100415-002	LC34-SB1003-034.0-20110119
R1100415-003	LC34-SB1003-047.0-20110119
R1100415-004	LC34-SB1003-053.0-20110119
R1100415-005	LC34-SB1002-028.0-20110119
R1100415-006	LC34-SB1002-034.0-20110119
R1100415-007	LC34-SB1002-047.0-20110119
R1100415-008	LC34-SB1002-053.0-20110119

All samples were received in good condition unless otherwise noted on the cooler receipt and preservation check form located at the end of this report.

All samples were preserved in accordance with approved analytical methods.

All samples have been analyzed by the approved methods cited on the analytical results pages.

All holding times and associated QC were within limits.

No analytical or QC problems were encountered.

All sampling activities performed by CAS personnel have been in accordance with "CAS Field Procedures and Measurements Manual" or by client specifications.

Samples have been subcontracted to the following laboratory(ies). The subcontractor's analytical report is attached:

RSA Geolab, LLC
Union, NJ

00002

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
Connecticut ID # PH0556	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158
Nebraska Accredited	West Virginia ID # 292
Navy Facilities Engineering Service Center Approved	

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-028.0-20110119
Lab Code: R1100415-001

Service Request: R1100415
Date Collected: 1/19/11 1629
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	77.6	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-028.0-20110119
Lab Code: R1100415-001

Service Request: R1100415
Date Collected: 1/19/11 1629
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1410	mg/Kg	540	140	1	NA	1/26/11 14:15	
Fraction Organic Carbon	Calculation	0.00141	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-034.0-20110119
Lab Code: R1100415-002

Service Request: R1100415
Date Collected: 1/19/11 1646
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	83.1	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-034.0-20110119
Lab Code: R1100415-002

Service Request: R1100415
Date Collected: 1/19/11 1646
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	440	mg/Kg	380	100	1	NA	1/26/11 14:15	
Fraction Organic Carbon	Calculation	0.00044	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-047.0-20110119
Lab Code: R1100415-003

Service Request: R1100415
Date Collected: 1/19/11 1657
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	74.9	Percent	1.0	1	NA	1/26/11 15:00	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-047.0-20110119
Lab Code: R1100415-003

Service Request: R1100415
Date Collected: 1/19/11 1657
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	3070	mg/Kg	610	160	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00307	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-053.0-20110119
Lab Code: R1100415-004

Service Request: R1100415
Date Collected: 1/19/11 1720
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	77.4	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1003-053.0-20110119
Lab Code: R1100415-004

Service Request: R1100415
Date Collected: 1/19/11 1720
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	650	mg/Kg	380	100	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00065	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-028.0-20110119
Lab Code: R1100415-005

Service Request: R1100415
Date Collected: 1/19/11 1629
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	78.3	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-028.0-20110119
Lab Code: R1100415-005

Service Request: R1100415
Date Collected: 1/19/11 1629
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1110	mg/Kg	350	90	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00111	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-034.0-20110119
Lab Code: R1100415-006

Service Request: R1100415
Date Collected: 1/19/11 1646
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	81.1	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-034.0-20110119
Lab Code: R1100415-006

Service Request: R1100415
Date Collected: 1/19/11 1646
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	990	mg/Kg	440	110	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00099	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-047.0-20110119
Lab Code: R1100415-007

Service Request: R1100415
Date Collected: 1/19/11 1657
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.2	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-047.0-20110119
Lab Code: R1100415-007

Service Request: R1100415
Date Collected: 1/19/11 1657
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	2630	mg/Kg	440	110	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00263	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-053.0-20110119
Lab Code: R1100415-008

Service Request: R1100415
Date Collected: 1/19/11 1720
Date Received: 1/21/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	76.9	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: LC34-SB1002-053.0-20110119
Lab Code: R1100415-008

Service Request: R1100415
Date Collected: 1/19/11 1720
Date Received: 1/21/11

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	860	mg/Kg	370	100	1	NA	1/27/11 12:00	
Fraction Organic Carbon	Calculation	0.00086	NONE	0.0003		1	NA		

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100415-MB1

Service Request: R1100415
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100415-MB1

Service Request: R1100415
Date Collected: NA
Date Received: NA

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	300	U	mg/Kg	300	80	1	NA	1/26/11 14:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100415-MB2

Service Request: R1100415
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100415-MB2

Service Request: R1100415
Date Collected: NA
Date Received: NA

Basis: Dry per method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahr 7-27-1988	300	U	mg/Kg	300	80	1	NA	1/27/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil

Service Request: R1100415
Date Analyzed: 1/26/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/Kg
Basis: Dry per method

Analyte Name	Method	Lab Control Sample R1100415-LCS1			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1730	2000	86	75 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34
Sample Matrix: Soil

Service Request: R1100415
Date Analyzed: 1/27/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/Kg
Basis: Dry per method

Analyte Name	Method	Lab Control Sample R1100415-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	2020	2000	101	75 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: *Geosynce*
 Project Manager: **CORY REPTA**

CHAIN OF CUSTODY
 Project: **ESTCP PED LC34**
 Telephone No. **321-495-1303**
 Fax No. _____

Page 1 of 2
 Method of Shipment _____
 Special Detection Limit/Reporting _____

Sample I.D.	Lab Sample No.	No. of Containers	Matrix					Sampling Date	Sampling Time	TOL LLOYD KAHN	APRN SIZE	% Solids	Turn Around Time (working days)
			Soil	Water	Air	Other	Yes						
LC34-SB1003-028.0 - 20110119	-001	2 X					1/19	1629	1	1		10	
LC34-SB1003-034.0 - 20110119	-002	2 X					↓	1646	1	1		↑	
LC34-SB1003-047.0 - 20110119	-003	2 X						1657	1	1		↑	
LC34-SB1003-053.0 - 20110119	-004	2 X						1720	1	1		↑	
LC34-SB1002-028.0 - 20110119	-005	3 X						1629	1	1		↑	
LC34-SB1002-034.0 - 20110119	-006	3 X						1646	1	1		↑	
LC34-SB1002-047.0 - 20110119	-007	3 X					↓	1657	1	1		10	

HOLD 90 Solids
 Samples
 HOLD 7 pads
 SIFL
 SD 1003-028.0
 20110119

Sample Received Intact: Yes No		Temperature received: Ice No ice	
Relinquished by	Date	Time	Received by (Sign & Print Name)
<i>[Signature]</i>	1/20	0615	<i>Amir Ahmad Daniel White</i>
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory
	Date	Time	Date

Lab Work No. _____

R1100415
 GeoSynce Consultants
 ESTCP PED LC34



000000

CHAIN OF CUSTODY

Method of Shipment

Client: **GEOSYNTEC**

Project: **ESTCP PED LC34**

Project Manager: **CORY REPTA**

Telephone No. **321-795-1303**

Fax No. **-**

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix	Prsv.	Sampling Date	Sampling Time	TBC LEAD KANAL	GRAIN SIZE	% Solids	Turn Around Time (working days)
LC34-381002-0580 - 20110119	508	3 X	Soil	No	1/19	1720	1	1	1	10
			Water							
			Air							
			Other							
			Yes							
			No							

Sample Received Intact:	Yes	No	Temperature received:	Ice	No ice
Relinq. by sampler (Sign & Print Name)					
Relinquished by <i>H. Dapkins MW</i>					
Relinquished by					
Relinquished by					

Received by (Sign & Print Name) *Daniel Ward* 1/21/11 / 0959

Received by

Received by

Received by laboratory

Date Time

Date Time

Date Time

Date Time

Lab Work No.

HOLD 90 solids
Samples

M A R K S

R1100415
Geosyntec Consultants
ESTCP PED LC34



00027

Cooler Receipt And Preservation Check Form

Project/Client Geosyntec Folder Number R1100415

Cooler received on 1/21/11 by: DPW COURIER: CAS UPS ~~REDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES ~~NO~~
2. Were custody papers properly filled out (ink, signed, etc.)? ~~YES~~ NO
3. Did all bottles arrive in good condition (unbroken)? ~~YES~~ NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO ~~N/A~~
5. Were ~~ice~~ or Ice packs present? ~~YES~~ NO
6. Where did the bottles originate? ~~CAS/ROC~~ CLIENT
7. Temperature of cooler(s) upon receipt: 4.3°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 1/21/11 1000

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: ~~Temp Blank~~ / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KS 1/21/11

Cooler Breakdown: Date: 1/21/11 Time: 1405 by: DPW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated ~~N/A~~

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH									
≤2	HNO ₃									No = Samples were preserved at lab as listed
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						PM OK to Adjust: _____
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis -- pH tested and recorded by VOAs or GenChem on a separate worksheet				
	Zn Aceta	-	-							
	HCl	*	*							

Bottle lot numbers: 112410-1VV, 092710-1MM

Other Comments: _____

PC Secondary Review: KS 2/1/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

1017 Greeley Ave North
Union, NJ 07083
908-964-0786
Fax: 908-964-5470
www.rsageolab.com

RSA Geolab, LLC

Client:
Karen Bunker
Columbia Analytical Services, INC
1 Mustard Street
Suite 250
Rochester, NY 14609

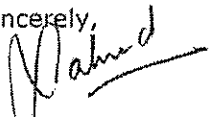
01-30-2011

Dear Karen,

Thank you for consulting with RSA Geolab, LLC for your Geotechnical Testing needs.
RSA is pleased to provide you with this final report for laboratory testing.

- Sieve Analysis (ASTM D422) LC-34-SB1002-028.0-20110119
- Sieve Analysis (ASTM D422) LC-34-SB1002-034.0-20110119
- Sieve Analysis (ASTM D422) LC-34-SB1002-047.0-20110119
- Sieve Analysis (ASTM D422) LC-34-SB1002-053.0-20110119

Sincerely,



Rasheed S. Ahmed
President/Lab Director
RSA Geolab, LLC

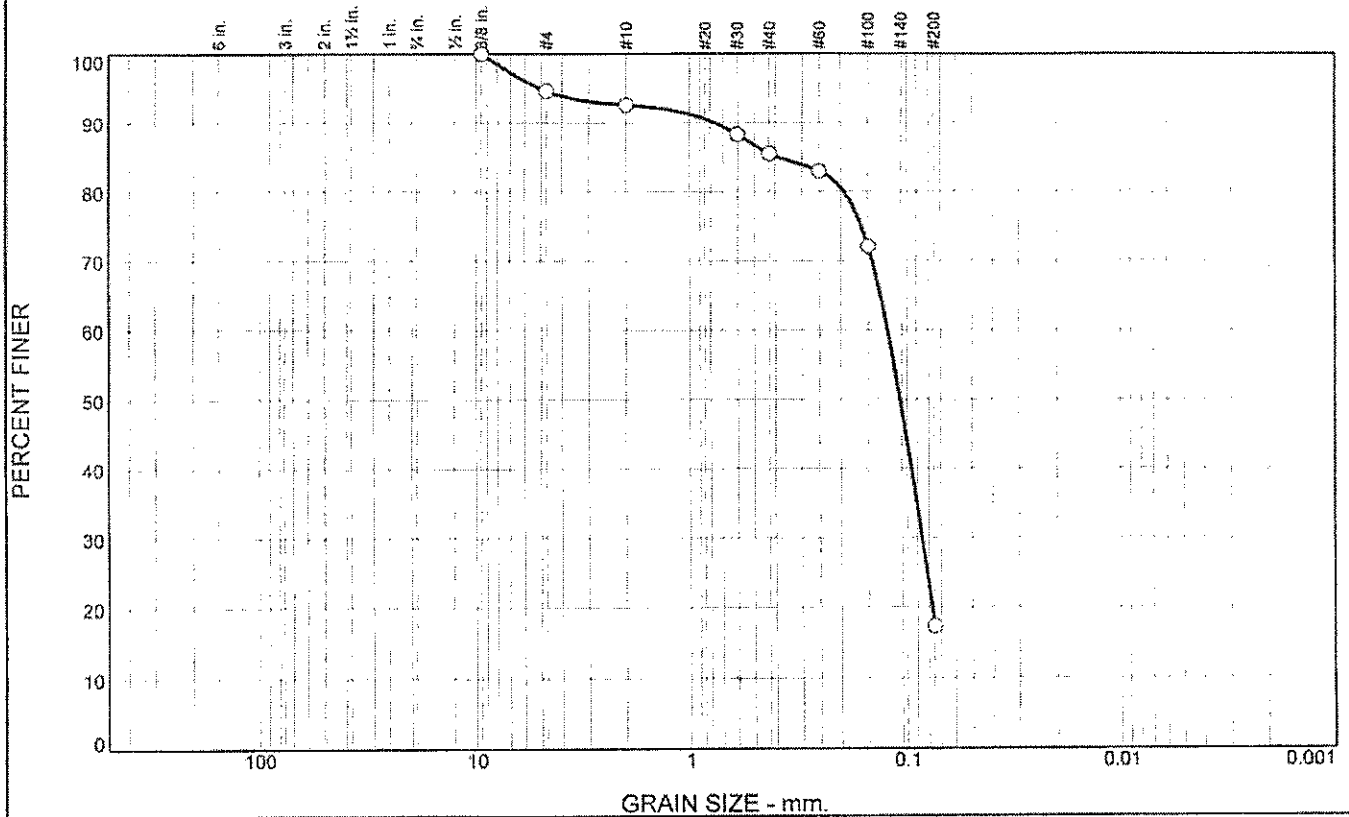
RSA Geolab, LLC
 1017 Greeley Ave N
 Union, NJ 07083
 P: 908-964-0786
 F: 908-964-5470

www.rsageolab.com
geolab13@yahoo.com

SAMPLE ID	#4	#10	#30	#60	#200	M.C. %	REMARKS/DESCRIPTION
LC-34-SB1002-028-0-20110119	93.3	92.6	88.3	83	17.4	26.07	Light grey mixed sand w/ pieces of shell
LC-34-SB1002-034-0-20110119	94.6	83.5	67.1	45.2	7	21.21	Light grey mixed sand w/ pieces of shell
LC-34-SB1002-047-0-20110119	93.4	92.2	89.3	85.4	47	38.8	Light grey mixed sand w/ pieces of shell
LC-34-SB1002-053-0-20110119	94	86.4	77.2	66	12.3	25	Light grey mixed sand w/ pieces of shell

QC SUMMARY
 CLIENT: COLUMBIA ANALYTICAL SERVICES, INC.
 CONTACT: KAREN BUNKER
 PROJECT NUMBER: 794

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.4	2.0	7.1	68.1	17.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	94.6		
#10	92.6		
#30	88.3		
#40	85.5		
#60	83.0		
#100	72.1		
#200	17.4		

* (no specification provided)

Material Description

LC34-SB1002-028.0-20110119

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.3895 D₆₀= 0.1224 D₅₀= 0.1075
D₃₀= 0.0857 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

MOISTURE CONTENT: 26.07 LIGHT GREY MIX SAND
PIECES OF SHELL

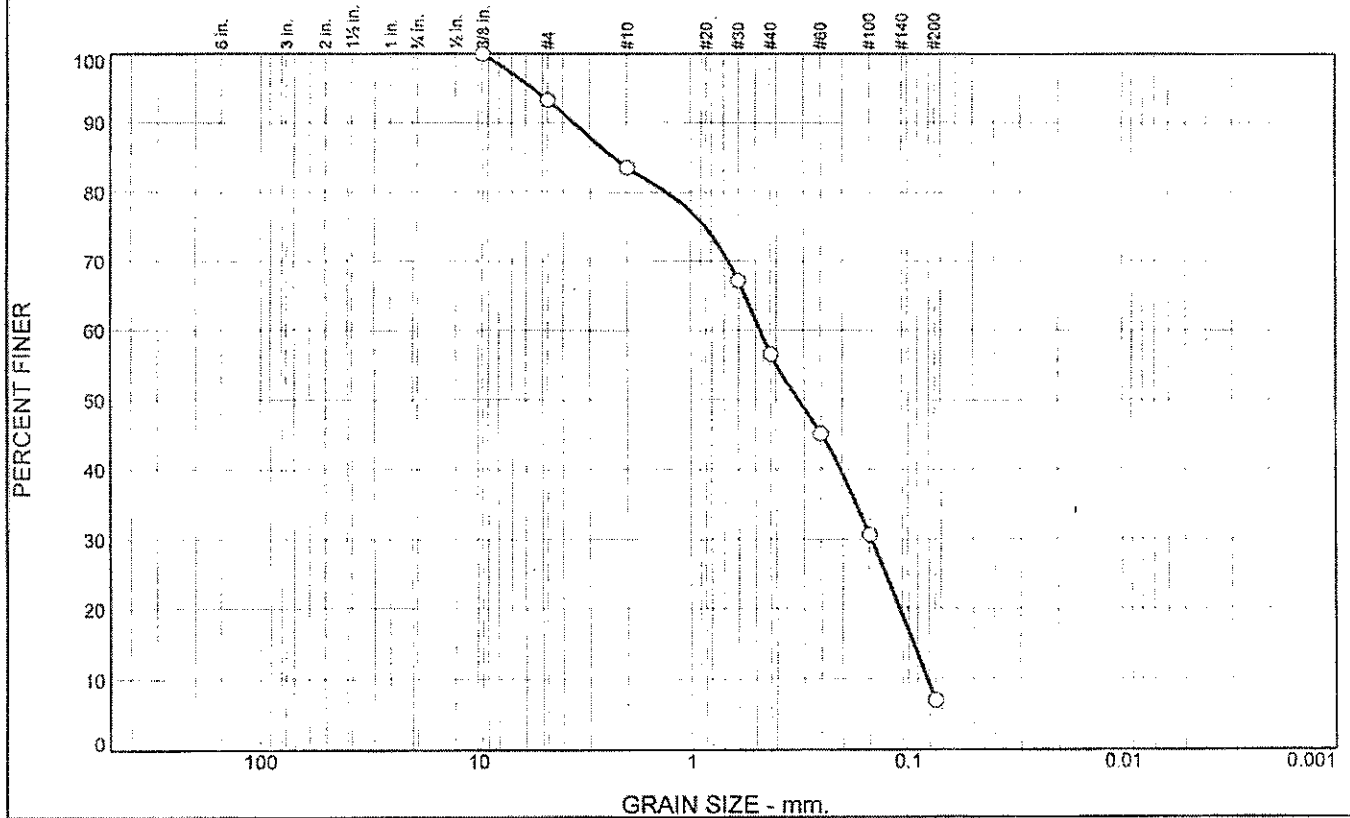
Date: 01/30/2011

RSA Geolab, LLC UNION, NJ	Client: Columbia Analytical Services Project: R-110415 Project No: 794
Date: 1/30/2011	

Tested By: RSA

Checked By: RSA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.7	9.8	27.0	49.5	7.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	93.3		
#10	83.5		
#30	67.1		
#40	56.5		
#60	45.2		
#100	30.6		
#200	7.0		

Material Description

LC34-SB1002-034.0-20110119
LIGHT GREY MIX SAND PIECED OF SHELL

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 2.3221 D₆₀= 0.4775 D₅₀= 0.3170
D₃₀= 0.1471 D₁₅= 0.0943 D₁₀= 0.0817
C_u= 5.84 C_c= 0.55

Classification

USCS= AASHTO=

Remarks

MOISTURE CONTENT 21.21

* (no specification provided)

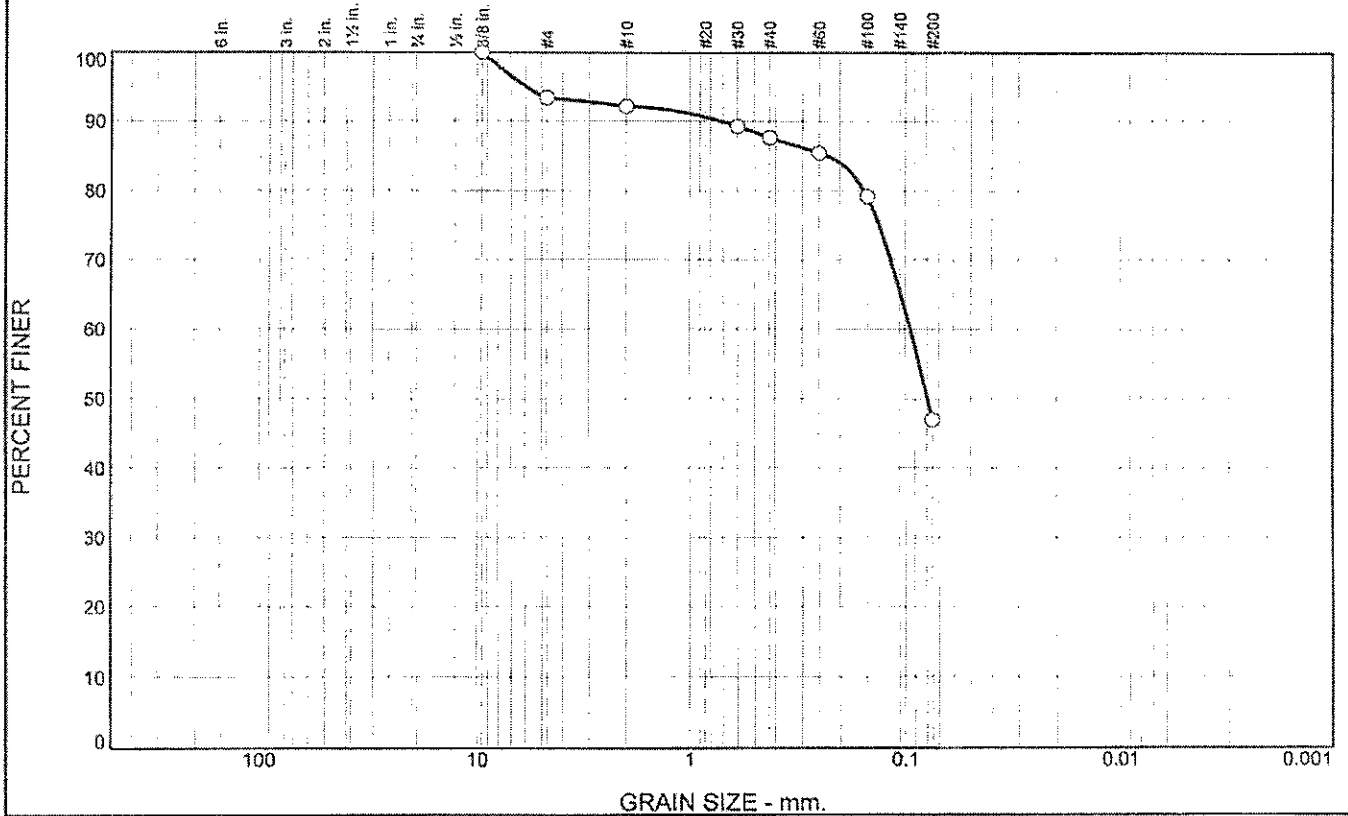
Date: 1/30/2011

RSA Geolab, LLC UNION, NJ	Client: Columbia Analytical Services Project: R-110415 Project No: 794 Date: 1/30/2011
--	---

Tested By: RSA

Checked By: RSA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.6	1.2	4.6	40.6	47.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	93.4		
#10	92.2		
#30	89.3		
#40	87.6		
#60	85.4		
#100	79.2		
#200	47.0		

Material Description

LC34-SB1002-047.0-20110119
LIGHT GREY MIX SAND PIECES OF SHELL

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.2297 D₆₀= 0.0950 D₅₀= 0.0791
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

MOISTURE CONTENT: 38.80

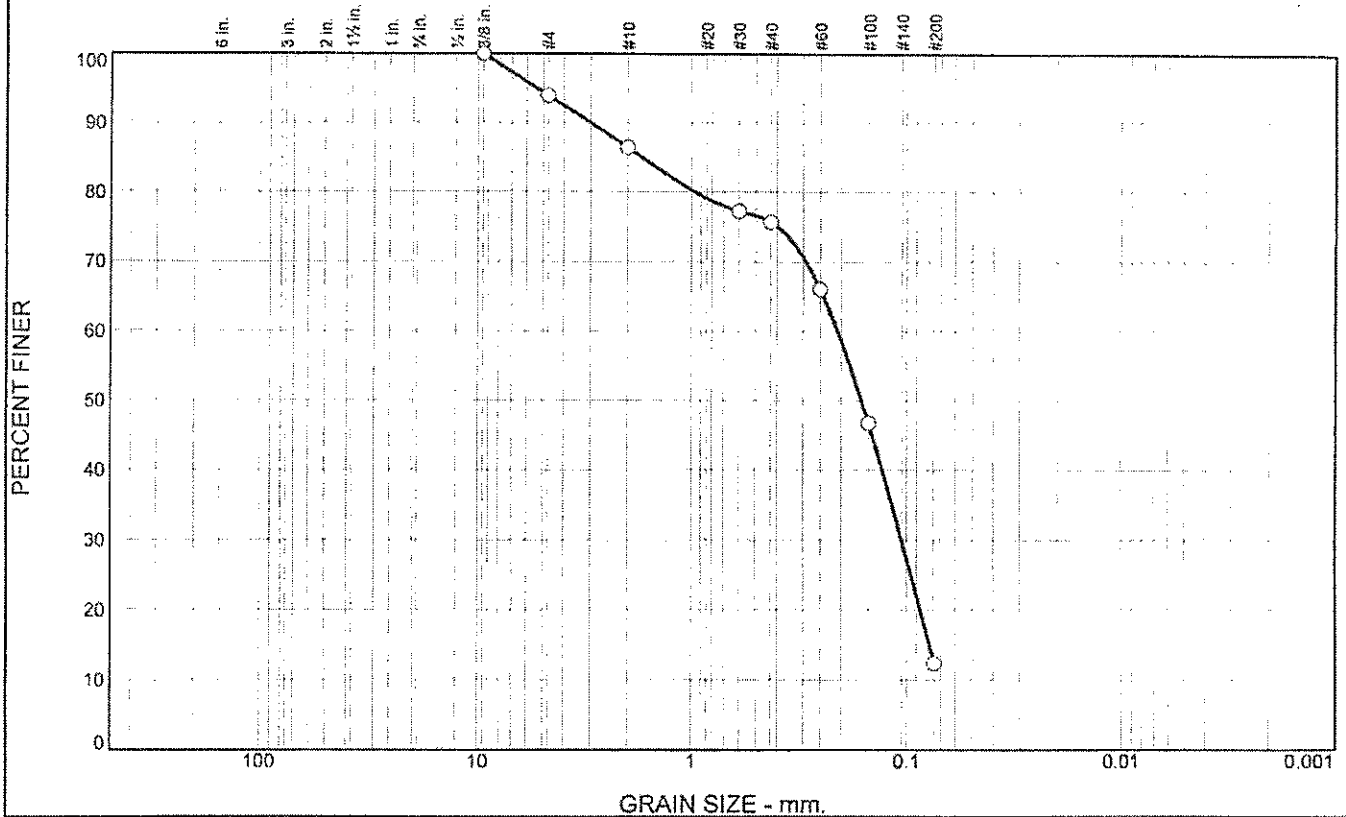
* (no specification provided)

Date: 1/30/2011

RSA Geolab, LLC UNION, NJ	Client: Columbia Analytical Services Project: R-110415 Project No: 794	Date: 1/30/2011
---	--	-----------------

Tested By: RSA Checked By: RSA

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.0	7.6	10.7	63.4	12.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	94.0		
#10	86.4		
#30	77.2		
#40	75.7		
#60	66.0		
#100	46.8		
#200	12.3		

Material Description

LC34-SB1002-053.0-20110119
LIGHT GREY MIX SAND PIECES OF SHELL

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 1.7119 D₆₀= 0.2075 D₅₀= 0.1613
D₃₀= 0.1057 D₁₅= 0.0789 D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

MOISTURE CONTENT: 25.0

* (no specification provided)

Date: 1/30/2011

RSA Geolab, LLC UNION, NJ	Client: Columbia Analytical Services Project: R-110415 Project No: 794 Date: 1/30/2011
-------------------------------------	---

Tested By: RSA

Checked By: RSA



KB LABS, INC.

25132 SW 1st Ave
Newberry, Florida 32669

Telephone (352) 472-5830

Fax (352) 472-5832

Email: info@kbmobilelabs.com

January 24, 2011

Rebecca DaPrato
GeoSyntec Consultants
6770 S. Washington Ave, Suite 3
Titusville, FL 32780

**RE: NASA CCAFS LC34, KSC, FL - Final Data Report
KB Labs Project # 11-5**

Dear Ms. DaPrato:

Enclosed is the final report of the on-site analysis performed by KB Labs, Inc. at the above referenced site. Samples were collected and analyzed on January 19, 2011. Included are a brief project narrative, data report narrative, tables listing quality control results, final analytical results, and sample chain-of-custody form.

KB Labs' mobile laboratories have been inspected by the FDOH Bureau of Laboratories and are NELAP Certified as of April 1, 2003. Our personnel, methodology, proficiency testing, and quality assurance requirements comply with the guidelines of Chapter 62-160 of the Florida Administrative Code and with the consensus standards adopted at the National Environmental Laboratory Accreditation Conference (NELAC). Data for the site referenced above were determined in accordance with published procedures under Test Methods for Evaluating Solid Waste (EPA SW-846, Update III Revised May 1997). Unless otherwise indicated on the quality control narrative accompanying the data report, the quality assurance and quality control procedures performed in conjunction with analysis of groundwater samples demonstrated that the reported data met our requirements for accuracy and precision under NELAC Standards.

If you have any questions, please do not hesitate to call me or Kelly Bergdoll, President of KB Labs, at (352) 367-0073.

Sincerely,

KB Labs, Inc.

Todd Romero
Director of Operations

"KB Labs is a small, woman-owned business enterprise."



KB Labs, Inc.
25132 SW 1st Ave
Newberry, FL 32669
Phone: 352-472-5830
Fax: 352-472-5832
Email: info@kbmobilelabs.com

PROJECT NARRATIVE

Project Scope

On January 19, 2011, a total of 19 soil samples were analyzed for GeoSyntec Consultants at NASA CCAFS LC34, KSC, FL. The samples were analyzed for vinyl chloride, 1,1-dichloroethene, cis- and trans-1, 2-dichloroethene, trichloroethene, tetrachloroethene, and n-butyl acetate.

NELAP Certification

KB Mobile Labs Unit KB3: FDOH NELAP Certification Number E82816

Note: KB Labs is not NELAC certified for N-butyl acetate. Data should be consider screening level only.

Analytical Procedure

All samples were analyzed using SW846 Method 5030/8260 for waters. Ten (10) milliliters (mL) of water or air (air samples) were purged with helium and the volatile organic compounds (VOCs) were collected on a solid-phase adsorption trap. The adsorption trap was heated and back-purged with helium. The components were then separated by capillary column gas chromatography and measured with a mass spectrometer (GC/MS) operated in the electron impact full-scan mode. The individual VOCs in the samples were measured against corresponding VOC standards.

The soil samples were analyzed using SW846 Method 5030/8260. One (1) gram (g) of soil sample was added to 10 mL of laboratory reagent water, heated and analyzed like a water sample as described above.

Unless otherwise indicated, soil data is calculated based on the matrix received (i.e. wet weight basis).

Analytical Results

Laboratory results were provided to the client on an as-completed or next-day basis. Final results of the on-site analyses are provided in a hardcopy report. The data produced and reported in the field has been reviewed and approved for this final report by the Director of Operations for KB Labs.

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25132 SW 1st Ave
Newberry, FL 32669
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Email: info@kbmobilelabs.com

Uncertainty of Reported Values

All measurement data presented in this report are subject to a degree of uncertainty and the degree of uncertainty varies with each compound of interest. KB Labs estimates the uncertainty of each measurement using a statistical evaluation of the standard deviation from the mean percent recovery of a number of trials of a given measurement. More specifically, KB Labs maintains historical percent recovery control limits at the 99% confidence level for each analyte of interest. These are calculated as ± 3 times the standard deviation from the mean of historical measurements of the percent recovery of spikes of the analytes of interest into actual and control sample matrices. For example, if the lower and upper percent recovery control limits for a specific analyte of interest have been determined to be 70 and 100 percent respectively, a reported value of 10.0 ug/L will be with 99% confidence 7.0 to 13.0 ug/L. For more information about KB Labs estimation of uncertainty, contact KB Labs' quality assurance officer and/or request a copy of KB Labs' SOP for determining measurement uncertainty.

Quality Control (QC) Data

Surrogate Recoveries – Table 1 lists the daily analytical sequence and percent recovery results for surrogate compounds, which were added to all analyses. Four (4) surrogate compounds were added to each analysis in order to continually monitor general method performance.

VOC Spike Recoveries – Table 2 lists the percent recovery results for matrix spike and laboratory control samples. A known amount of each target compound was added to selected field samples and to laboratory reagent water in order to monitor the performance of each of the target compounds in the actual matrix and in laboratory reagent water.

Method Blanks – Daily analysis of laboratory reagent water samples was performed in order to monitor the cleanliness of the analytical system.

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DATA REPORT NARRATIVE

1. All sample data has been reviewed and, if required, updated in the Final Data Report for rounding and significant figures.
2. Sample ID LC34-SB1001-024.0-20110119 has an "L" qualifier for c-1, 2-dichloroethene indicating the Concentration exceeded Calibration range. Sample was reanalyzed later in the run sequence at medium-level. Data inconsistent with original run. Original run considered best reportable analytical data.
3. As per NASA client request for diluted samples between the lab RL and MDL are reported with FDEP Data Qualifier "I".
4. Reporting limits for sample ID SB1004-037.0-20110119 adjusted to correct dilution level.

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KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: GeoSyntec Consultants	Driller/Sampler: GeoSyntec Consultants	Analyst: Glenn Jackson
Site: NASA CCAFS LC34	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 11-5
On-site Dates: 1/19/11	Client Project Manager: Rebecca DaPrato	Matrix: Soil

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
VSTD 20	01/19/11	69	68	99	105	< LCL	< LCL	Pass	Pass
RSTD 20	01/19/11	98	119	102	105	Pass	Pass	Pass	Pass
BLANK	01/19/11	104	115	101	98	Pass	Pass	Pass	Pass
LC34-SB1001-024.0	01/19/11	102	108	104	104	Pass	Pass	Pass	Pass
LC34-SB1001-035.5	01/19/11	107	114	100	100	Pass	Pass	Pass	Pass
LC34-SB1001-041.0	01/19/11	105	113	101	98	Pass	Pass	Pass	Pass
LC34-SB1001-044.5.	01/19/11	108	120	100	103	Pass	Pass	Pass	Pass
LC34-SB1002-044.5	01/19/11	103	110	103	98	Pass	Pass	Pass	Pass
LC34-SB1002-046.5	01/19/11	108	114	102	100	Pass	Pass	Pass	Pass
LC34-SB1002-049.5	01/19/11	106	115	101	99	Pass	Pass	Pass	Pass
LC34-SB1002-055.0	01/19/11	109	115	101	99	Pass	Pass	Pass	Pass
LC34-SB1003-037.5	01/19/11	108	124	99	99	Pass	Pass	Pass	Pass
LC34-SB1003-043.0	01/19/11	108	113	101	101	Pass	Pass	Pass	Pass
LC34-SB1003-044.0	01/19/11	107	114	100	97	Pass	Pass	Pass	Pass
LC34-SB1003-046.0	01/19/11	109	118	99	94	Pass	Pass	Pass	Pass
LC34-SB1003-049.5	01/19/11	106	120	101	98	Pass	Pass	Pass	Pass
LC34-SB1004-034.5	01/19/11	110	120	98	99	Pass	Pass	Pass	Pass
LC34-SB1004-037.0	01/19/11	108	116	100	95	Pass	Pass	Pass	Pass
LC34-SB1004-043.0	01/19/11	109	118	98	97	Pass	Pass	Pass	Pass
LC34-SB1004-045.0	01/19/11	106	113	98	101	Pass	Pass	Pass	Pass
LC34-SB1004-046.5	01/19/11	107	116	98	95	Pass	Pass	Pass	Pass
LC34-SB1004-050.0	01/19/11	109	118	99	98	Pass	Pass	Pass	Pass
LC34-SB1001-024.0	01/19/11	109	118	97	97	Pass	Pass	Pass	Pass
LC34-SB1002-055.0 MS	01/19/11	100	107	101	104	Pass	Pass	Pass	Pass
LC34-SB1002-055.0 MSD	01/19/11	103	115	100	102	Pass	Pass	Pass	Pass
VSTD 20	01/19/11	103	117	100	103	Pass	Pass	Pass	Pass

Comments: Although some surrogates may be out of the control percent recovery range, other supporting QC, such as matrix spikes, matrix spike duplicates, method blanks, and laboratory control samples, are performed by KB Labs to further validate reported data.

***Surrogate Compounds:**

S1 = Dibromofluoromethane (84% - 121%)

S2 = 1,2- Dichloroethane-D4 (69% - 133%)

S3 = Toluene-D8 (87% - 111%)

S4 = 4-Bromofluorobenzene (76% - 125%)

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: GeoSyntec Consultants	Driller/Sampler: GeoSyntec Consultants	Analyst: Glenn Jackson
Site: NASA CCAFS LC34	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 11-5
Onsite Dates: 1/19/11	Client Project Manager: Rebecca DaPrato	Matrix: Soil

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Samples: SB1002 55'	Date of Analysis: 1/19/2011								
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Vinyl Chloride	46	156	20	103	96	7	Pass	Pass	Pass
1,1-Dichloroethene	47	150	20	117	108	8	Pass	Pass	Pass
Trans-1,2-Dichloroethene	61	135	20	112	104	7	Pass	Pass	Pass
Cis-1,2-Dichloroethene	62	141	20	112	106	6	Pass	Pass	Pass
Trichloroethene	60	127	20	110	102	7	Pass	Pass	Pass
Tetrachloroethene	50	132	20	107	99	8	Pass	Pass	Pass
n-Butyl Actetate	70	130	20	112	104	8	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit and method guidelines.

Laboratory Control Spikes (LCS):

Samples: LCS 1	Date of Analysis: 1/19/2011								
Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	LCS#1				LCS#1		
Vinyl Chloride	52	to 150	108				Pass		
1,1-Dichloroethene	58	to 132	117				Pass		
Trans-1,2-Dichloroethene	54	to 140	116				Pass		
Cis-1,2-Dichloroethene	67	to 126	118				Pass		
Trichloroethene	68	to 119	111				Pass		
Tetrachloroethene	58	to 127	111				Pass		
n-Butyl Acetate	70	to 130	116				Pass		

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit and method guidelines.



KB LABS, INC.

Final Data Report

Project Number : 11-5

NASA CCAFS LC34

KSC, FL

Prepared for: GeoSyntec Consultants

Sample ID	Analysis Date	Matrix	Dilution Factor	Vinyl chloride	1,1-Dichloroethene	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	n-Butyl Acetate
Soil MDL (mg/kg)				0.0031	0.0039	0.0045	0.0051	0.0041	0.0034	NA
LC34-SB1001-024.0-20110119	1/19/11	Soil	1	0.048	<0.10	0.026	1.4 L	0.019	<0.010	<0.050
LC34-SB1001-035.5-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	2.0	3.2	<0.10	<0.50
LC34-SB1001-041.0-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	4.2	2.6	<0.10	<0.50
LC34-SB1001-044.5-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	1.4	5.7	<0.10	<0.50
LC34-SB1002-044.5-20110119	1/19/11	Soil	1	<0.010	<0.010	<0.010	0.058	<0.010	<0.010	<0.050
LC34-SB1002-046.5-20110119	1/19/11	Soil	1	<0.010	<0.010	<0.010	0.55	0.030	<0.010	<0.050
LC34-SB1002-049.5-20110119	1/19/11	Soil	1	<0.010	<0.010	<0.010	0.015	<0.010	<0.010	<0.050
LC34-SB1002-055.0-20110119	1/19/11	Soil	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
LC34-SB1003-037.5-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	7.0	3.7	<0.10	<0.50
LC34-SB1003-043.0-20110119	1/19/11	Soil	5m	<0.50	<0.50	<0.50	0.36 l	7.3	<0.50	<2.5
LC34-SB1003-044.0-20110119	1/19/11	Soil	5m	<0.50	<0.50	<0.50	0.76	22	<0.50	<2.5
LC34-SB1003-046.0-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	1.1	6.8	<0.10	<0.50
LC34-SB1003-049.5-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	2.0	7.2	<0.10	<0.50

Reporting units for waters are ug/L and for soils are mg/kg.
m = medium level soil analysis



KB LABS, INC.

Final Data Report

Project Number : 11-5

NASA CCAFS LC34

KSC, FL

Prepared for: GeoSyntec Consultants

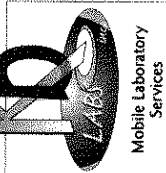
Sample ID	Analysis Date	Matrix	Dilution Factor	Vinyl chloride	1,1-Dichloroethene	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	n-Butyl Acetate
Soil MDL (mg/kg)				0.0031	0.0039	0.0045	0.0051	0.0041	0.0034	NA
LC34-SB1004-034.5-20110119	1/19/11	Soil	1m	0.050 I	0.054 I	0.10	2.0	0.77	0.042 I	<0.50
LC34-SB1004-037.0-20110119	1/19/11	Soil	5m	0.22 I	<0.50	<0.50	15	<0.50	<0.50	<2.5
LC34-SB1004-043.0-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	0.98	3.4	<0.10	<0.50
LC34-SB1004-045.0-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	3.8	5.4	<0.10	<0.50
LC34-SB1004-046.5-20110119	1/19/11	Soil	1m	<0.10	<0.10	<0.10	2.0	0.35	<0.10	<0.50
LC34-SB1004-050.0-20110119	1/19/11	Soil	1	<0.010	<0.010	<0.010	0.022	<0.010	<0.010	<0.050

Reporting units for waters are ug/L and for soils are mg/kg.
m = medium level soil analysis

CHAIN-OF-CUSTODY RECORD

25132 SW 1st Avenue
 Newberry, FL 32669
 TEL (352) 472-5830
 FAX (352) 472-5832

200 Quade Drive
 Cary, NC 27513
 TEL (919) 678-0030

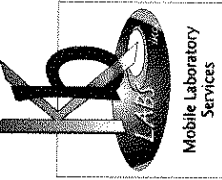


MOBILE UNIT #

K03

CLIENT NAME		PROJECT NAME & ADDRESS					MOBILE UNIT #				
Geosyntec		LC39 KSC, FL					K03				
SAMPLERS		CONTACT PERSON		BATCH # (Lab Use Only)		IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS					
		LC39				VOLATILES					
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PRESERVATION	COMMENT / SAMPLE PREFIX
SB1001	24' 1/12/11	0905			1/11/11	1145		So	1	C	
↓	35.5'	0930								H	
↓	41'	0948								O	
↓	44.5'	1009									
SB1002	44.5'	1016									
↓	46.5'	1030									
↓	48.5'	1039									
↓	53'	1046									
SB1003	37.5'	1319									
↓	43'	1324									
↓	44'	1330									
↓	46'	1354									
↓	48.5'	1352									
SB1004	34.5'	1519									
↓	37.0'	1530									
↓		1545									
Purified Containers		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations			
Relinquished by: (Signature)				<i>[Signature]</i>		1/19/11					
Relinquished by: (Signature)				Received by: (Signature)							

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



CHAIN-OF-CUSTODY RECORD

25132 SW 1st Avenue
Newberry, FL 32669
TEL (352) 472-5830
FAX (352) 472-5832

200 Quade Drive
Cary, NC 27513
TEL (919) 678-0030

MOBILE UNIT #
253

CLIENT NAME	PROJECT NAME & ADDRESS	SAMPLE MATRIX	IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS	PRESERVATION																				
<i>Geosyntec</i>	<i>LC34</i>	<i>1CSGFZ</i>	VOLATILES	Chilled HCL Other (see Remarks)																				
					SAMPLERS	CONTACT PERSON	STATION LOCATION / No.	DATE SAMPLED	TIME SAMPLED	DATE RECD	TIME RECD	GRAB	COMP	NUMBER OF CONTAINERS										
					<i>SB1004-0430</i>	<i>1/19/11</i>	<i>15523</i>	<i>1/19/11</i>	<i>1545</i>	<i>1/19/11</i>	<i>1545</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>1</i>										
					<i>0450</i>	<i>1553</i>	<i>1553</i>	<i>1553</i>	<i>1500</i>	<i>1500</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>1</i>											
<i>0465</i>	<i>1555</i>	<i>1555</i>	<i>1555</i>	<i>1500</i>	<i>1500</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>1</i>																
<i>0500</i>	<i>1556</i>	<i>1556</i>	<i>1556</i>	<i>1500</i>	<i>1500</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>1</i>																
Prelimined Containers Relinquished by: <i>(Signature)</i>			Date / Time	Received by: <i>(Signature)</i>	Date / Time																			
Relinquished by: <i>(Signature)</i>			Date / Time	Received by: <i>(Signature)</i>	Date / Time																			
Matrix Types										Remarks and Observations														

February 17, 2011

Service Request No: R1100627

Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34/ TR0272

Dear Cory:

Enclosed are the results of the sample(s) submitted to our laboratory on February 2, 2011. For your reference, these analyses have been assigned our service request number **R1100627**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 68

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1100627
Date Received: 2/2/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Seventeen (17) water samples including one (1) Trip Blank were collected by the client on 2/1/11 and were received for analysis at Columbia Analytical Services on 2/2/11 via a national courier. The samples were received at a cooler temperature of 2°C, within the 0-6°C guidelines.

Volatile Organic Compounds by EPA Method 8260C

Water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except the following:

N-Butyl acetate %Differences (%D) was out at 24.6%D (criteria is $\pm 20\%$) on the 2/3/11 CCV

n-Butanol %D was -22.1%D on the 2/4/11 CCV

n-Butanol %D was -29.7%D on the 2/8/11 CCV.

When CCV %D criteria are not met, it may indicate some bias in the quantitation for that target compound in the associated samples. These compounds were not detected in all samples associated with the outlying CCV's, therefore data was acceptable.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits except for Dichlorodifluoromethane on the 2/4/11 analytical run which was outside limits, high. The recovery has been flagged as "**". No data was affected.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The hits are flagged as "E", estimated. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". Both sets of data are included in the report.

Samples were analyzed within 7 days from collection, the holding time for unpreserved vials.

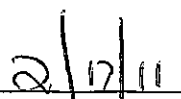
The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date



00002

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1100627

<u>Lab ID</u>	<u>Client ID</u>
R1100627-001	LC34-BW0003A-024.5-20110201
R1100627-002	LC34-BW0003B-031.5-20110201
R1100627-003	LC34-BW0003E-052.5-20110201
R1100627-004	LC34-BW0003F-059.5-20110201
R1100627-005	TRIP BLANK
R1100627-006	LC34-BW0002A-024.5-20110201
R1100627-007	LC34-BW0002B-031.5-20110201
R1100627-008	LC34-BW0002C-038.5-20110201
R1100627-009	LC34-BW0002D-045.5-20110201
R1100627-010	LC34-BW0002E-052.5-20110201
R1100627-011	LC34-BW0002F-059.5-20110201
R1100627-012	LC34-BW0001A-024.5-20110201
R1100627-013	LC34-BW0001B-031.5-20110201
R1100627-014	LC34-BW0001C-038.5-20110201
R1100627-015	LC34-BW0001D-045.5-20110201
R1100627-016	LC34-BW0001E-052.5-20110201
R1100627-017	LC34-BW0001F-059.5-20110201

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
Connecticut ID # PH0556	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158
Nebraska Accredited	West Virginia ID # 292
Navy Facilities Engineering Service Center Approved	

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1511
 Date Received: 2/ 2/11
 Date Analyzed: 2/3/11 18:46

Sample Name: LC34-BW0003A-024.5-20110201
 Lab Code: R1100627-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020311\0399.D\

Analysis Lot: 234827
 Instrument Name: R-MS-10
 Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	60	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	60	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	60	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	U	1000	80	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	60	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	
106-93-4	1,2-Dibromoethane	1000	U	1000	60	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	80	
107-06-2	1,2-Dichloroethane	1000	U	1000	60	
78-87-5	1,2-Dichloropropane	1000	U	1000	140	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	72	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	68	
71-36-3	n-Butanol	10000	U	10000	1400	
78-93-3	2-Butanone (MEK)	2000	U	2000	200	
591-78-6	2-Hexanone	2000	U	2000	80	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	68	
67-64-1	Acetone	4000	U	4000	320	
71-43-2	Benzene	1000	U	1000	62	
75-27-4	Bromodichloromethane	1000	U	1000	82	
75-25-2	Bromoform	1000	U	1000	60	
74-83-9	Bromomethane	1000	U	1000	80	
75-15-0	Carbon Disulfide	2000	U	2000	70	
56-23-5	Carbon Tetrachloride	1000	U	1000	72	
108-90-7	Chlorobenzene	1000	U	1000	60	
75-00-3	Chloroethane	1000	U	1000	60	
67-66-3	Chloroform	1000	U	1000	60	
74-87-3	Chloromethane	1000	U	1000	92	
110-82-7	Cyclohexane	2000	U	2000	60	
124-48-1	Dibromochloromethane	1000	U	1000	60	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	
75-09-2	Dichloromethane	1000	U	1000	60	
100-41-4	Ethylbenzene	1000	U	1000	84	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1511
Date Received: 2/ 2/11
Date Analyzed: 2/3/11 18:46

Sample Name: LC34-BW0003A-024.5-20110201
Lab Code: R1100627-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0399.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	68	
79-20-9	Methyl Acetate	2000	U	2000	140	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	60	
108-87-2	Methylcyclohexane	2000	U	2000	60	
100-42-5	Styrene	1000	U	1000	70	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	84	
108-88-3	Toluene	1000	U	1000	60	
79-01-6	Trichloroethene (TCE)	1000	U	1000	60	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	60	
75-01-4	Vinyl Chloride	13000		1000	60	
156-59-2	cis-1,2-Dichloroethene	37000		1000	60	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	60	
179601-23-1	m,p-Xylenes	1000	U	1000	170	
123-86-4	n-Butyl Acetate	1000	U	1000	60	
95-47-6	o-Xylene	1000	U	1000	80	
156-60-5	trans-1,2-Dichloroethene	1000	U	1000	60	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	60	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/3/11 18:46	
Dibromofluoromethane	105	89-119	2/3/11 18:46	
Toluene-d8	110	87-121	2/3/11 18:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1552
 Date Received: 2/ 2/11
 Date Analyzed: 2/3/11 19:16

Sample Name: LC34-BW0003B-031.5-20110201
 Lab Code: R1100627-002

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020311\D0400.D\

Analysis Lot: 234827
 Instrument Name: R-MS-10
 Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	30	
79-00-5	1,1,2-Trichloroethane	500	U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500	U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	
106-93-4	1,2-Dibromoethane	500	U	500	30	
95-50-1	1,2-Dichlorobenzene	500	U	500	40	
107-06-2	1,2-Dichloroethane	500	U	500	30	
78-87-5	1,2-Dichloropropane	500	U	500	66	
541-73-1	1,3-Dichlorobenzene	500	U	500	36	
106-46-7	1,4-Dichlorobenzene	500	U	500	34	
71-36-3	n-Butanol	5000	U	5000	670	
78-93-3	2-Butanone (MEK)	1000	U	1000	100	
591-78-6	2-Hexanone	1000	U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	34	
67-64-1	Acetone	2000	U	2000	160	
71-43-2	Benzene	500	U	500	31	
75-27-4	Bromodichloromethane	500	U	500	41	
75-25-2	Bromoform	500	U	500	30	
74-83-9	Bromomethane	500	U	500	40	
75-15-0	Carbon Disulfide	1000	U	1000	35	
56-23-5	Carbon Tetrachloride	500	U	500	36	
108-90-7	Chlorobenzene	500	U	500	30	
75-00-3	Chloroethane	500	U	500	30	
67-66-3	Chloroform	500	U	500	30	
74-87-3	Chloromethane	500	U	500	46	
110-82-7	Cyclohexane	1000	U	1000	30	
124-48-1	Dibromochloromethane	500	U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	73	
75-09-2	Dichloromethane	500	U	500	30	
100-41-4	Ethylbenzene	500	U	500	42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1552
Date Received: 2/ 2/11
Date Analyzed: 2/3/11 19:16

Sample Name: LC34-BW0003B-031.5-20110201
Lab Code: R1100627-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020311\0400.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	500	U	500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	5300		500	30	
156-59-2	cis-1,2-Dichloroethene	16000		500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	500	U	500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	2/3/11 19:16	
Dibromofluoromethane	106	89-119	2/3/11 19:16	
Toluene-d8	111	87-121	2/3/11 19:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1538
Date Received: 2/ 2/11
Date Analyzed: 2/3/11 19:46

Sample Name: LC34-BW0003E-052.5-20110201
Lab Code: R1100627-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020311\0401.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1538
Date Received: 2/ 2/11
Date Analyzed: 2/3/11 19:46

Sample Name: LC34-BW0003E-052.5-20110201
Lab Code: R1100627-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0401.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	23		5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	2/3/11 19:46	
Dibromofluoromethane	106	89-119	2/3/11 19:46	
Toluene-d8	111	87-121	2/3/11 19:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1501
 Date Received: 2/ 2/11
 Date Analyzed: 2/3/11 20:16

Sample Name: LC34-BW0003F-059.5-20110201
 Lab Code: R1100627-004

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoal0\data\020311\0402.D\

Analysis Lot: 234827
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1501
Date Received: 2/ 2/11
Date Analyzed: 2/3/11 20:16

Sample Name: LC34-BW0003F-059.5-20110201
Lab Code: R1100627-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0402.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/3/11 20:16	
Dibromofluoromethane	107	89-119	2/3/11 20:16	
Toluene-d8	112	87-121	2/3/11 20:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1550
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 01:15

Sample Name: TRIP BLANK
 Lab Code: R1100627-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\0412.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1550
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 01:15

Sample Name: TRIP BLANK
Lab Code: R1100627-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0412.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/4/11 01:15	
Dibromofluoromethane	107	89-119	2/4/11 01:15	
Toluene-d8	110	87-121	2/4/11 01:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1419
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 01:45

Sample Name: LC34-BW0002A-024.5-20110201
 Lab Code: R1100627-006

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020311\0413.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 200

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000 U	1000	60	
79-34-5	1,1,2,2-Tetrachloroethane	1000 U	1000	60	
79-00-5	1,1,2-Trichloroethane	1000 U	1000	60	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	64000 E	1000	80	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000 U	1000	60	
75-35-4	1,1-Dichloroethene (1,1-DCE)	170 J	1000	74	
120-82-1	1,2,4-Trichlorobenzene	1000 U	1000	60	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000 U	1000	86	
106-93-4	1,2-Dibromoethane	1000 U	1000	60	
95-50-1	1,2-Dichlorobenzene	1000 U	1000	80	
107-06-2	1,2-Dichloroethane	1000 U	1000	60	
78-87-5	1,2-Dichloropropane	1000 U	1000	140	
541-73-1	1,3-Dichlorobenzene	1000 U	1000	72	
106-46-7	1,4-Dichlorobenzene	1000 U	1000	68	
71-36-3	n-Butanol	10000 U	10000	1400	
78-93-3	2-Butanone (MEK)	2000 U	2000	200	
591-78-6	2-Hexanone	2000 U	2000	80	
108-10-1	4-Methyl-2-pentanone	2000 U	2000	68	
67-64-1	Acetone	4000 U	4000	320	
71-43-2	Benzene	1000 U	1000	62	
75-27-4	Bromodichloromethane	1000 U	1000	82	
75-25-2	Bromoform	1000 U	1000	60	
74-83-9	Bromomethane	1000 U	1000	80	
75-15-0	Carbon Disulfide	2000 U	2000	70	
56-23-5	Carbon Tetrachloride	1000 U	1000	72	
108-90-7	Chlorobenzene	1000 U	1000	60	
75-00-3	Chloroethane	1000 U	1000	60	
67-66-3	Chloroform	1000 U	1000	60	
74-87-3	Chloromethane	1000 U	1000	92	
110-82-7	Cyclohexane	2000 U	2000	60	
124-48-1	Dibromochloromethane	1000 U	1000	60	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000 U	1000	150	
75-09-2	Dichloromethane	1000 U	1000	60	
100-41-4	Ethylbenzene	1000 U	1000	84	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1419
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 01:45

Sample Name: LC34-BW0002A-024.5-20110201
Lab Code: R1100627-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020311\0413.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	68	
79-20-9	Methyl Acetate	2000	U	2000	140	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	60	
108-87-2	Methylcyclohexane	2000	U	2000	60	
100-42-5	Styrene	1000	U	1000	70	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	84	
108-88-3	Toluene	1000	U	1000	60	
79-01-6	Trichloroethene (TCE)	530	J	1000	60	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	60	
75-01-4	Vinyl Chloride	110	J	1000	60	
156-59-2	cis-1,2-Dichloroethene	36000		1000	60	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	60	
179601-23-1	m,p-Xylenes	1000	U	1000	170	
123-86-4	n-Butyl Acetate	1000	U	1000	60	
95-47-6	o-Xylene	1000	U	1000	80	
156-60-5	trans-1,2-Dichloroethene	690	J	1000	60	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	60	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 01:45	
Dibromofluoromethane	107	89-119	2/4/11 01:45	
Toluene-d8	110	87-121	2/4/11 01:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 14:19
 Date Received: 2/ 2/11
 Date Analyzed: 2/8/11 14:24

Sample Name: LC34-BW0002A-024.5-20110201
 Lab Code: R1100627-006
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020811\0462.D\

Analysis Lot: 235304
 Instrument Name: R-MS-10
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	67000	D	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1419
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 14:24

Sample Name: LC34-BW0002A-024.5-20110201
Lab Code: R1100627-006
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020811\0462.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	550	DJ	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	2500	U	2500	150	
156-59-2	cis-1,2-Dichloroethene	32000	D	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	590	DJ	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/8/11 14:24	
Dibromofluoromethane	107	89-119	2/8/11 14:24	
Toluene-d8	111	87-121	2/8/11 14:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1342
 Date Received: 2/ 2/11
 Date Analyzed: 2/8/11 14:54

Sample Name: LC34-BW0002B-031.5-20110201
 Lab Code: R1100627-007

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020811\0463.D\

Analysis Lot: 235304
 Instrument Name: R-MS-10
 Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	75	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	75	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	75	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	230	J	1300	100	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	75	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	
106-93-4	1,2-Dibromoethane	1300	U	1300	75	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	100	
107-06-2	1,2-Dichloroethane	1300	U	1300	75	
78-87-5	1,2-Dichloropropane	1300	U	1300	170	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	90	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	85	
71-36-3	n-Butanol	13000	U	13000	1700	
78-93-3	2-Butanone (MEK)	2500	U	2500	250	
591-78-6	2-Hexanone	2500	U	2500	100	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	85	
67-64-1	Acetone	5000	U	5000	400	
71-43-2	Benzene	1300	U	1300	78	
75-27-4	Bromodichloromethane	1300	U	1300	110	
75-25-2	Bromoform	1300	U	1300	75	
74-83-9	Bromomethane	1300	U	1300	100	
75-15-0	Carbon Disulfide	2500	U	2500	88	
56-23-5	Carbon Tetrachloride	1300	U	1300	90	
108-90-7	Chlorobenzene	1300	U	1300	75	
75-00-3	Chloroethane	1300	U	1300	75	
67-66-3	Chloroform	1300	U	1300	75	
74-87-3	Chloromethane	1300	U	1300	120	
110-82-7	Cyclohexane	2500	U	2500	75	
124-48-1	Dibromochloromethane	1300	U	1300	75	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	
75-09-2	Dichloromethane	1300	U	1300	75	
100-41-4	Ethylbenzene	1300	U	1300	110	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1342
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 14:54

Sample Name: LC34-BW0002B-031.5-20110201
Lab Code: R1100627-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020811\0463.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	85	
79-20-9	Methyl Acetate	2500	U	2500	170	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	75	
108-87-2	Methylcyclohexane	2500	U	2500	75	
100-42-5	Styrene	1300	U	1300	88	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	110	
108-88-3	Toluene	1300	U	1300	75	
79-01-6	Trichloroethene (TCE)	17000		1300	75	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	75	
75-01-4	Vinyl Chloride	230	J	1300	75	
156-59-2	cis-1,2-Dichloroethene	44000		1300	75	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	75	
179601-23-1	m,p-Xylenes	1300	U	1300	210	
123-86-4	n-Butyl Acetate	1300	U	1300	75	
95-47-6	o-Xylene	1300	U	1300	100	
156-60-5	trans-1,2-Dichloroethene	390	J	1300	75	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	75	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/8/11 14:54	
Dibromofluoromethane	109	89-119	2/8/11 14:54	
Toluene-d8	111	87-121	2/8/11 14:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1307
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 02:44

Sample Name: LC34-BW0002C-038.5-20110201
 Lab Code: R1100627-008

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020311\D0415.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	75	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	75	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	75	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	100	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	75	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	
106-93-4	1,2-Dibromoethane	1300	U	1300	75	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	100	
107-06-2	1,2-Dichloroethane	1300	U	1300	75	
78-87-5	1,2-Dichloropropane	1300	U	1300	170	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	90	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	85	
71-36-3	n-Butanol	13000	U	13000	1700	
78-93-3	2-Butanone (MEK)	2500	U	2500	250	
591-78-6	2-Hexanone	2500	U	2500	100	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	85	
67-64-1	Acetone	5000	U	5000	400	
71-43-2	Benzene	1300	U	1300	78	
75-27-4	Bromodichloromethane	1300	U	1300	110	
75-25-2	Bromoform	1300	U	1300	75	
74-83-9	Bromomethane	1300	U	1300	100	
75-15-0	Carbon Disulfide	2500	U	2500	88	
56-23-5	Carbon Tetrachloride	1300	U	1300	90	
108-90-7	Chlorobenzene	1300	U	1300	75	
75-00-3	Chloroethane	1300	U	1300	75	
67-66-3	Chloroform	1300	U	1300	75	
74-87-3	Chloromethane	1300	U	1300	120	
110-82-7	Cyclohexane	2500	U	2500	75	
124-48-1	Dibromochloromethane	1300	U	1300	75	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	
75-09-2	Dichloromethane	1300	U	1300	75	
100-41-4	Ethylbenzene	1300	U	1300	110	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 02:44

Sample Name: LC34-BW0002C-038.5-20110201
Lab Code: R1100627-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0415.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	85	
79-20-9	Methyl Acetate	2500	U	2500	170	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	75	
108-87-2	Methylcyclohexane	2500	U	2500	75	
100-42-5	Styrene	1300	U	1300	88	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	110	
108-88-3	Toluene	1300	U	1300	75	
79-01-6	Trichloroethene (TCE)	620	J	1300	75	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	75	
75-01-4	Vinyl Chloride	700	J	1300	75	
156-59-2	cis-1,2-Dichloroethene	78000	E	1300	75	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	75	
179601-23-1	m,p-Xylenes	1300	U	1300	210	
123-86-4	n-Butyl Acetate	1300	U	1300	75	
95-47-6	o-Xylene	1300	U	1300	100	
156-60-5	trans-1,2-Dichloroethene	510	J	1300	75	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	75	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/4/11 02:44	
Dibromofluoromethane	109	89-119	2/4/11 02:44	
Toluene-d8	109	87-121	2/4/11 02:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 20:02

Sample Name: LC34-BW0002C-038.5-20110201
Lab Code: R1100627-008
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020411\0445.D\

Analysis Lot: 234996
Instrument Name: R-MS-10
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 20:02

Sample Name: LC34-BW0002C-038.5-20110201
Lab Code: R1100627-008
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020411\0445.D\

Analysis Lot: 234996
Instrument Name: R-MS-10
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	710	DJ	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	880	DJ	2500	150	
156-59-2	cis-1,2-Dichloroethene	87000	D	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	640	DJ	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 20:02	
Dibromofluoromethane	112	89-119	2/4/11 20:02	
Toluene-d8	112	87-121	2/4/11 20:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1038
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 20:32

Sample Name: LC34-BW0002D-045.5-20110201
 Lab Code: R1100627-009

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020411\0446.D\

Analysis Lot: 234996
 Instrument Name: R-MS-10
 Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	7.5	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	7.5	
79-00-5	1,1,2-Trichloroethane	130	U	130	7.5	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	130	U	130	10	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	7.5	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130	U	130	9.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	7.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	11	
106-93-4	1,2-Dibromoethane	130	U	130	7.5	
95-50-1	1,2-Dichlorobenzene	130	U	130	10	
107-06-2	1,2-Dichloroethane	130	U	130	7.5	
78-87-5	1,2-Dichloropropane	130	U	130	17	
541-73-1	1,3-Dichlorobenzene	130	U	130	9.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	8.5	
71-36-3	n-Butanol	1300	U	1300	170	
78-93-3	2-Butanone (MEK)	250	U	250	25	
591-78-6	2-Hexanone	250	U	250	10	
108-10-1	4-Methyl-2-pentanone	250	U	250	8.5	
67-64-1	Acetone	500	U	500	40	
71-43-2	Benzene	130	U	130	7.8	
75-27-4	Bromodichloromethane	130	U	130	11	
75-25-2	Bromoform	130	U	130	7.5	
74-83-9	Bromomethane	130	U	130	10	
75-15-0	Carbon Disulfide	250	U	250	8.8	
56-23-5	Carbon Tetrachloride	130	U	130	9.0	
108-90-7	Chlorobenzene	130	U	130	7.5	
75-00-3	Chloroethane	130	U	130	7.5	
67-66-3	Chloroform	130	U	130	7.5	
74-87-3	Chloromethane	130	U	130	12	
110-82-7	Cyclohexane	250	U	250	7.5	
124-48-1	Dibromochloromethane	130	U	130	7.5	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	19	
75-09-2	Dichloromethane	130	U	130	7.5	
100-41-4	Ethylbenzene	130	U	130	11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1038
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 20:32

Sample Name: LC34-BW0002D-045.5-20110201
Lab Code: R1100627-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020411\0446.D\

Analysis Lot: 234996
Instrument Name: R-MS-10
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	130	U	130	8.5	
79-20-9	Methyl Acetate	250	U	250	17	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	7.5	
108-87-2	Methylcyclohexane	250	U	250	7.5	
100-42-5	Styrene	130	U	130	8.8	
127-18-4	Tetrachloroethene (PCE)	130	U	130	11	
108-88-3	Toluene	130	U	130	7.5	
79-01-6	Trichloroethene (TCE)	39	J	130	7.5	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	7.5	
75-01-4	Vinyl Chloride	52	J	130	7.5	
156-59-2	cis-1,2-Dichloroethene	4200		130	7.5	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	7.5	
179601-23-1	m,p-Xylenes	130	U	130	21	
123-86-4	n-Butyl Acetate	130	U	130	7.5	
95-47-6	o-Xylene	130	U	130	10	
156-60-5	trans-1,2-Dichloroethene	29	J	130	7.5	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	7.5	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/4/11 20:32	
Dibromofluoromethane	110	89-119	2/4/11 20:32	
Toluene-d8	113	87-121	2/4/11 20:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 0952
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 03:44

Sample Name: LC34-BW0002E-052.5-20110201
 Lab Code: R1100627-010

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020311\0417.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0952
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 03:44

Sample Name: LC34-BW0002E-052.5-20110201
Lab Code: R1100627-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\D0417.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	0.78	J	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	9.3		5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/4/11 03:44	
Dibromofluoromethane	108	89-119	2/4/11 03:44	
Toluene-d8	110	87-121	2/4/11 03:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0857
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 04:14

Sample Name: LC34-BW0002F-059.5-20110201
Lab Code: R1100627-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoal0\data\020311\0418.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	25 U	25	1.5	
79-34-5	1,1,2,2-Tetrachloroethane	25 U	25	1.5	
79-00-5	1,1,2-Trichloroethane	25 U	25	1.5	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	25 U	25	2.0	
75-34-3	1,1-Dichloroethane (1,1-DCA)	25 U	25	1.5	
75-35-4	1,1-Dichloroethene (1,1-DCE)	25 U	25	1.9	
120-82-1	1,2,4-Trichlorobenzene	25 U	25	1.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	25 U	25	2.2	
106-93-4	1,2-Dibromoethane	25 U	25	1.5	
95-50-1	1,2-Dichlorobenzene	25 U	25	2.0	
107-06-2	1,2-Dichloroethane	25 U	25	1.5	
78-87-5	1,2-Dichloropropane	25 U	25	3.4	
541-73-1	1,3-Dichlorobenzene	25 U	25	1.8	
106-46-7	1,4-Dichlorobenzene	25 U	25	1.8	
71-36-3	n-Butanol	250 U	250	34	
78-93-3	2-Butanone (MEK)	50 U	50	5.0	
591-78-6	2-Hexanone	50 U	50	2.0	
108-10-1	4-Methyl-2-pentanone	50 U	50	1.8	
67-64-1	Acetone	100 U	100	8.0	
71-43-2	Benzene	25 U	25	1.6	
75-27-4	Bromodichloromethane	25 U	25	2.1	
75-25-2	Bromoform	25 U	25	1.5	
74-83-9	Bromomethane	25 U	25	2.0	
75-15-0	Carbon Disulfide	50 U	50	1.8	
56-23-5	Carbon Tetrachloride	25 U	25	1.8	
108-90-7	Chlorobenzene	25 U	25	1.5	
75-00-3	Chloroethane	25 U	25	1.5	
67-66-3	Chloroform	25 U	25	1.5	
74-87-3	Chloromethane	25 U	25	2.4	
110-82-7	Cyclohexane	50 U	50	1.5	
124-48-1	Dibromochloromethane	25 U	25	1.5	
75-71-8	Dichlorodifluoromethane (CFC 12)	25 U	25	3.7	
75-09-2	Dichloromethane	25 U	25	1.5	
100-41-4	Ethylbenzene	25 U	25	2.1	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0857
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 04:14

Sample Name: LC34-BW0002F-059.5-20110201
Lab Code: R1100627-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020311\0418.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	25	U	25	1.8	
79-20-9	Methyl Acetate	50	U	50	3.4	
1634-04-4	Methyl tert-Butyl Ether	25	U	25	1.5	
108-87-2	Methylcyclohexane	50	U	50	1.5	
100-42-5	Styrene	25	U	25	1.8	
127-18-4	Tetrachloroethene (PCE)	25	U	25	2.1	
108-88-3	Toluene	25	U	25	1.5	
79-01-6	Trichloroethene (TCE)	10	J	25	1.5	
75-69-4	Trichlorofluoromethane (CFC 11)	25	U	25	1.5	
75-01-4	Vinyl Chloride	28		25	1.5	
156-59-2	cis-1,2-Dichloroethene	880		25	1.5	
10061-01-5	cis-1,3-Dichloropropene	25	U	25	1.5	
179601-23-1	m,p-Xylenes	25	U	25	4.1	
123-86-4	n-Butyl Acetate	25	U	25	1.5	
95-47-6	o-Xylene	25	U	25	2.0	
156-60-5	trans-1,2-Dichloroethene	5.0	J	25	1.5	
10061-02-6	trans-1,3-Dichloropropene	25	U	25	1.5	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/4/11 04:14	
Dibromofluoromethane	108	89-119	2/4/11 04:14	
Toluene-d8	110	87-121	2/4/11 04:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 0848
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 04:44

Sample Name: LC34-BW0001A-024.5-20110201
 Lab Code: R1100627-012

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\020311\0419.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	30	
79-00-5	1,1,2-Trichloroethane	500	U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	140000	E	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500	U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	
106-93-4	1,2-Dibromoethane	500	U	500	30	
95-50-1	1,2-Dichlorobenzene	500	U	500	40	
107-06-2	1,2-Dichloroethane	500	U	500	30	
78-87-5	1,2-Dichloropropane	500	U	500	66	
541-73-1	1,3-Dichlorobenzene	500	U	500	36	
106-46-7	1,4-Dichlorobenzene	500	U	500	34	
71-36-3	n-Butanol	5000	U	5000	670	
78-93-3	2-Butanone (MEK)	1000	U	1000	100	
591-78-6	2-Hexanone	1000	U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	34	
67-64-1	Acetone	2000	U	2000	160	
71-43-2	Benzene	500	U	500	31	
75-27-4	Bromodichloromethane	500	U	500	41	
75-25-2	Bromoform	500	U	500	30	
74-83-9	Bromomethane	500	U	500	40	
75-15-0	Carbon Disulfide	1000	U	1000	35	
56-23-5	Carbon Tetrachloride	500	U	500	36	
108-90-7	Chlorobenzene	500	U	500	30	
75-00-3	Chloroethane	500	U	500	30	
67-66-3	Chloroform	500	U	500	30	
74-87-3	Chloromethane	500	U	500	46	
110-82-7	Cyclohexane	1000	U	1000	30	
124-48-1	Dibromochloromethane	500	U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	73	
75-09-2	Dichloromethane	500	U	500	30	
100-41-4	Ethylbenzene	500	U	500	42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0848
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 04:44

Sample Name: LC34-BW0001A-024.5-20110201
Lab Code: R1100627-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0419.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	300	J	500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	4700		500	30	
156-59-2	cis-1,2-Dichloroethene	36000	E	500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	640		500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/4/11 04:44	
Dibromofluoromethane	108	89-119	2/4/11 04:44	
Toluene-d8	112	87-121	2/4/11 04:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 0848
 Date Received: 2/ 2/11
 Date Analyzed: 2/8/11 15:23

Sample Name: LC34-BW0001A-024.5-20110201
 Lab Code: R1100627-012
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020811\0464.D\

Analysis Lot: 235304
 Instrument Name: R-MS-10
 Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	300	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	300	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	300	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	120000	D	5000	400	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	300	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	370	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	300	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	430	
106-93-4	1,2-Dibromoethane	5000	U	5000	300	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	400	
107-06-2	1,2-Dichloroethane	5000	U	5000	300	
78-87-5	1,2-Dichloropropane	5000	U	5000	660	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	360	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	340	
71-36-3	n-Butanol	50000	U	50000	6700	
78-93-3	2-Butanone (MEK)	10000	U	10000	1000	
591-78-6	2-Hexanone	10000	U	10000	400	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	340	
67-64-1	Acetone	20000	U	20000	1600	
71-43-2	Benzene	5000	U	5000	310	
75-27-4	Bromodichloromethane	5000	U	5000	410	
75-25-2	Bromoform	5000	U	5000	300	
74-83-9	Bromomethane	5000	U	5000	400	
75-15-0	Carbon Disulfide	10000	U	10000	350	
56-23-5	Carbon Tetrachloride	5000	U	5000	360	
108-90-7	Chlorobenzene	5000	U	5000	300	
75-00-3	Chloroethane	5000	U	5000	300	
67-66-3	Chloroform	5000	U	5000	300	
74-87-3	Chloromethane	5000	U	5000	460	
110-82-7	Cyclohexane	10000	U	10000	300	
124-48-1	Dibromochloromethane	5000	U	5000	300	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	730	
75-09-2	Dichloromethane	5000	U	5000	300	
100-41-4	Ethylbenzene	5000	U	5000	420	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0848
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 15:23

Sample Name: LC34-BW0001A-024.5-20110201
Lab Code: R1100627-012
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020811\0464.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	340	
79-20-9	Methyl Acetate	10000	U	10000	660	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	300	
108-87-2	Methylcyclohexane	10000	U	10000	300	
100-42-5	Styrene	5000	U	5000	350	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	420	
108-88-3	Toluene	5000	U	5000	300	
79-01-6	Trichloroethene (TCE)	350	DJ	5000	300	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	300	
75-01-4	Vinyl Chloride	4100	DJ	5000	300	
156-59-2	cis-1,2-Dichloroethene	31000	D	5000	300	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	300	
179601-23-1	m,p-Xylenes	5000	U	5000	810	
123-86-4	n-Butyl Acetate	5000	U	5000	300	
95-47-6	o-Xylene	5000	U	5000	400	
156-60-5	trans-1,2-Dichloroethene	520	DJ	5000	300	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	300	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/8/11 15:23	
Dibromofluoromethane	107	89-119	2/8/11 15:23	
Toluene-d8	110	87-121	2/8/11 15:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 0936
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 05:14

Sample Name: LC34-BW0001B-031.5-20110201
 Lab Code: R1100627-013

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\D0420.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	60	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	60	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	60	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	140000	E	1000	80	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	60	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	
106-93-4	1,2-Dibromoethane	1000	U	1000	60	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	80	
107-06-2	1,2-Dichloroethane	1000	U	1000	60	
78-87-5	1,2-Dichloropropane	1000	U	1000	140	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	72	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	68	
71-36-3	n-Butanol	10000	U	10000	1400	
78-93-3	2-Butanone (MEK)	2000	U	2000	200	
591-78-6	2-Hexanone	2000	U	2000	80	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	68	
67-64-1	Acetone	4000	U	4000	320	
71-43-2	Benzene	1000	U	1000	62	
75-27-4	Bromodichloromethane	1000	U	1000	82	
75-25-2	Bromoform	1000	U	1000	60	
74-83-9	Bromomethane	1000	U	1000	80	
75-15-0	Carbon Disulfide	2000	U	2000	70	
56-23-5	Carbon Tetrachloride	1000	U	1000	72	
108-90-7	Chlorobenzene	1000	U	1000	60	
75-00-3	Chloroethane	1000	U	1000	60	
67-66-3	Chloroform	1000	U	1000	60	
74-87-3	Chloromethane	1000	U	1000	92	
110-82-7	Cyclohexane	2000	U	2000	60	
124-48-1	Dibromochloromethane	1000	U	1000	60	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	
75-09-2	Dichloromethane	1000	U	1000	60	
100-41-4	Ethylbenzene	1000	U	1000	84	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0936
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 05:14

Sample Name: LC34-BW0001B-031.5-20110201
Lab Code: R1100627-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0420.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	68	
79-20-9	Methyl Acetate	2000	U	2000	140	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	60	
108-87-2	Methylcyclohexane	2000	U	2000	60	
100-42-5	Styrene	1000	U	1000	70	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	84	
108-88-3	Toluene	1000	U	1000	60	
79-01-6	Trichloroethene (TCE)	27000		1000	60	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	60	
75-01-4	Vinyl Chloride	160	J	1000	60	
156-59-2	cis-1,2-Dichloroethene	6600		1000	60	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	60	
179601-23-1	m,p-Xylenes	1000	U	1000	170	
123-86-4	n-Butyl Acetate	1000	U	1000	60	
95-47-6	o-Xylene	1000	U	1000	80	
156-60-5	trans-1,2-Dichloroethene	150	J	1000	60	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	60	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 05:14	
Dibromofluoromethane	109	89-119	2/4/11 05:14	
Toluene-d8	110	87-121	2/4/11 05:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 0936
 Date Received: 2/ 2/11
 Date Analyzed: 2/8/11 15:54

Sample Name: LC34-BW0001B-031.5-20110201
 Lab Code: R1100627-013
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020811\0465.D\

Analysis Lot: 235304
 Instrument Name: R-MS-10
 Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	300	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	300	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	300	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	130000	D	5000	400	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	300	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	370	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	300	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	430	
106-93-4	1,2-Dibromoethane	5000	U	5000	300	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	400	
107-06-2	1,2-Dichloroethane	5000	U	5000	300	
78-87-5	1,2-Dichloropropane	5000	U	5000	660	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	360	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	340	
71-36-3	n-Butanol	50000	U	50000	6700	
78-93-3	2-Butanone (MEK)	10000	U	10000	1000	
591-78-6	2-Hexanone	10000	U	10000	400	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	340	
67-64-1	Acetone	20000	U	20000	1600	
71-43-2	Benzene	5000	U	5000	310	
75-27-4	Bromodichloromethane	5000	U	5000	410	
75-25-2	Bromoform	5000	U	5000	300	
74-83-9	Bromomethane	5000	U	5000	400	
75-15-0	Carbon Disulfide	10000	U	10000	350	
56-23-5	Carbon Tetrachloride	5000	U	5000	360	
108-90-7	Chlorobenzene	5000	U	5000	300	
75-00-3	Chloroethane	5000	U	5000	300	
67-66-3	Chloroform	5000	U	5000	300	
74-87-3	Chloromethane	5000	U	5000	460	
110-82-7	Cyclohexane	10000	U	10000	300	
124-48-1	Dibromochloromethane	5000	U	5000	300	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	730	
75-09-2	Dichloromethane	5000	U	5000	300	
100-41-4	Ethylbenzene	5000	U	5000	420	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 0936
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 15:54

Sample Name: LC34-BW0001B-031.5-20110201
Lab Code: R1100627-013
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020811\D0465.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	340	
79-20-9	Methyl Acetate	10000	U	10000	660	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	300	
108-87-2	Methylcyclohexane	10000	U	10000	300	
100-42-5	Styrene	5000	U	5000	350	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	420	
108-88-3	Toluene	5000	U	5000	300	
79-01-6	Trichloroethene (TCE)	23000	D	5000	300	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	300	
75-01-4	Vinyl Chloride	5000	U	5000	300	
156-59-2	cis-1,2-Dichloroethene	6000	D	5000	300	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	300	
179601-23-1	m,p-Xylenes	5000	U	5000	810	
123-86-4	n-Butyl Acetate	5000	U	5000	300	
95-47-6	o-Xylene	5000	U	5000	400	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	300	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	300	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/8/11 15:54	
Dibromofluoromethane	109	89-119	2/8/11 15:54	
Toluene-d8	110	87-121	2/8/11 15:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1031
 Date Received: 2/ 2/11
 Date Analyzed: 2/8/11 16:24

Sample Name: LC34-BW0001C-038.5-20110201
 Lab Code: R1100627-014

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020811\D0466.D\

Analysis Lot: 235304
 Instrument Name: R-MS-10
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1600	J	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1031
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 16:24

Sample Name: LC34-BW0001C-038.5-20110201
Lab Code: R1100627-014

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020811\0466.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	53000		2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	2500	U	2500	150	
156-59-2	cis-1,2-Dichloroethene	47000		2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	280	J	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/8/11 16:24	
Dibromofluoromethane	108	89-119	2/8/11 16:24	
Toluene-d8	110	87-121	2/8/11 16:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1307
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 06:13

Sample Name: LC34-BW0001D-045.5-20110201
 Lab Code: R1100627-015

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\0422.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	43000		2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 06:13

Sample Name: LC34-BW0001D-045.5-20110201
Lab Code: R1100627-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0422.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	140000	E	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	2500	U	2500	150	
156-59-2	cis-1,2-Dichloroethene	5200		2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	2500	U	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 06:13	
Dibromofluoromethane	108	89-119	2/4/11 06:13	
Toluene-d8	110	87-121	2/4/11 06:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 16:54

Sample Name: LC34-BW0001D-045.5-20110201
Lab Code: R1100627-015
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020811\0467.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	300	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	300	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	300	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	51000	D	5000	400	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	300	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	370	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	300	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	430	
106-93-4	1,2-Dibromoethane	5000	U	5000	300	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	400	
107-06-2	1,2-Dichloroethane	5000	U	5000	300	
78-87-5	1,2-Dichloropropane	5000	U	5000	660	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	360	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	340	
71-36-3	n-Butanol	50000	U	50000	6700	
78-93-3	2-Butanone (MEK)	10000	U	10000	1000	
591-78-6	2-Hexanone	10000	U	10000	400	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	340	
67-64-1	Acetone	20000	U	20000	1600	
71-43-2	Benzene	5000	U	5000	310	
75-27-4	Bromodichloromethane	5000	U	5000	410	
75-25-2	Bromoform	5000	U	5000	300	
74-83-9	Bromomethane	5000	U	5000	400	
75-15-0	Carbon Disulfide	10000	U	10000	350	
56-23-5	Carbon Tetrachloride	5000	U	5000	360	
108-90-7	Chlorobenzene	5000	U	5000	300	
75-00-3	Chloroethane	5000	U	5000	300	
67-66-3	Chloroform	5000	U	5000	300	
74-87-3	Chloromethane	5000	U	5000	460	
110-82-7	Cyclohexane	10000	U	10000	300	
124-48-1	Dibromochloromethane	5000	U	5000	300	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	730	
75-09-2	Dichloromethane	5000	U	5000	300	
100-41-4	Ethylbenzene	5000	U	5000	420	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1307
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 16:54

Sample Name: LC34-BW0001D-045.5-20110201
Lab Code: R1100627-015
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020811\0467.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	340	
79-20-9	Methyl Acetate	10000	U	10000	660	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	300	
108-87-2	Methylcyclohexane	10000	U	10000	300	
100-42-5	Styrene	5000	U	5000	350	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	420	
108-88-3	Toluene	5000	U	5000	300	
79-01-6	Trichloroethene (TCE)	150000	D	5000	300	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	300	
75-01-4	Vinyl Chloride	5000	U	5000	300	
156-59-2	cis-1,2-Dichloroethene	5200	D	5000	300	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	300	
179601-23-1	m,p-Xylenes	5000	U	5000	810	
123-86-4	n-Butyl Acetate	5000	U	5000	300	
95-47-6	o-Xylene	5000	U	5000	400	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	300	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	300	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/8/11 16:54	
Dibromofluoromethane	108	89-119	2/8/11 16:54	
Toluene-d8	111	87-121	2/8/11 16:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1346
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 17:24

Sample Name: LC34-BW0001E-052.5-20110201
Lab Code: R1100627-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020811\0468.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	3.0	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	3.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	3.0	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	50	U	50	4.0	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	3.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	3.7	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	3.0	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	4.3	
106-93-4	1,2-Dibromoethane	50	U	50	3.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	4.0	
107-06-2	1,2-Dichloroethane	50	U	50	3.0	
78-87-5	1,2-Dichloropropane	50	U	50	6.7	
541-73-1	1,3-Dichlorobenzene	50	U	50	3.6	
106-46-7	1,4-Dichlorobenzene	50	U	50	3.5	
71-36-3	n-Butanol	500	U	500	67	
78-93-3	2-Butanone (MEK)	100	U	100	10	
591-78-6	2-Hexanone	100	U	100	4.0	
108-10-1	4-Methyl-2-pentanone	100	U	100	3.5	
67-64-1	Acetone	200	U	200	16	
71-43-2	Benzene	50	U	50	3.1	
75-27-4	Bromodichloromethane	50	U	50	4.1	
75-25-2	Bromoform	50	U	50	3.0	
74-83-9	Bromomethane	50	U	50	4.0	
75-15-0	Carbon Disulfide	100	U	100	3.5	
56-23-5	Carbon Tetrachloride	50	U	50	3.6	
108-90-7	Chlorobenzene	50	U	50	3.0	
75-00-3	Chloroethane	50	U	50	3.0	
67-66-3	Chloroform	50	U	50	3.0	
74-87-3	Chloromethane	50	U	50	4.7	
110-82-7	Cyclohexane	100	U	100	3.0	
124-48-1	Dibromochloromethane	50	U	50	3.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	7.3	
75-09-2	Dichloromethane	50	U	50	3.0	
100-41-4	Ethylbenzene	50	U	50	4.2	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1346
Date Received: 2/ 2/11
Date Analyzed: 2/8/11 17:24

Sample Name: LC34-BW0001E-052.5-20110201
Lab Code: R1100627-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\020811\0468.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	3.5	
79-20-9	Methyl Acetate	100	U	100	6.7	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	3.0	
108-87-2	Methylcyclohexane	100	U	100	3.0	
100-42-5	Styrene	50	U	50	3.5	
127-18-4	Tetrachloroethene (PCE)	50	U	50	4.2	
108-88-3	Toluene	50	U	50	3.0	
79-01-6	Trichloroethene (TCE)	1600		50	3.0	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	3.0	
75-01-4	Vinyl Chloride	50	U	50	3.0	
156-59-2	cis-1,2-Dichloroethene	220		50	3.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	3.0	
179601-23-1	m,p-Xylenes	50	U	50	8.2	
123-86-4	n-Butyl Acetate	50	U	50	3.0	
95-47-6	o-Xylene	50	U	50	4.0	
156-60-5	trans-1,2-Dichloroethene	50	U	50	3.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	3.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/8/11 17:24	
Dibromofluoromethane	110	89-119	2/8/11 17:24	
Toluene-d8	111	87-121	2/8/11 17:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: 2/ 1/11 1430
 Date Received: 2/ 2/11
 Date Analyzed: 2/4/11 07:13

Sample Name: LC34-BW0001F-059.5-20110201
 Lab Code: R1100627-017

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\0424.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.79	J	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: 2/ 1/11 1430
Date Received: 2/ 2/11
Date Analyzed: 2/4/11 07:13

Sample Name: LC34-BW0001F-059.5-20110201
Lab Code: R1100627-017

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020311\0424.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	3.5	J	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	0.79	J	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 07:13	
Dibromofluoromethane	109	89-119	2/4/11 07:13	
Toluene-d8	111	87-121	2/4/11 07:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/3/11 12:47

Sample Name: Method Blank
 Lab Code: RQ1101159-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\0387.D\

Analysis Lot: 234827
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: NA
Date Received: NA
Date Analyzed: 2/3/11 12:47

Sample Name: Method Blank
Lab Code: RQ1101159-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\020311\0387.D\

Analysis Lot: 234827
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	2/3/11 12:47	
Dibromofluoromethane	106	89-119	2/3/11 12:47	
Toluene-d8	110	87-121	2/3/11 12:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/4/11 00:45

Sample Name: Method Blank
 Lab Code: RQ1101213-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\020311\0411.D\

Analysis Lot: 234829
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: NA
Date Received: NA
Date Analyzed: 2/4/11 00:45

Sample Name: Method Blank
Lab Code: RQ1101213-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020311\0411.D\

Analysis Lot: 234829
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/4/11 00:45	
Dibromofluoromethane	106	89-119	2/4/11 00:45	
Toluene-d8	110	87-121	2/4/11 00:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/4/11 13:31

Sample Name: Method Blank
 Lab Code: RQ1101220-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\020411\0432.D\

Analysis Lot: 234996
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: NA
Date Received: NA
Date Analyzed: 2/4/11 13:31

Sample Name: Method Blank
Lab Code: RQ1101220-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020411\0432.D\

Analysis Lot: 234996
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/4/11 13:31	
Dibromofluoromethane	107	89-119	2/4/11 13:31	
Toluene-d8	110	87-121	2/4/11 13:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: NA
Date Received: NA
Date Analyzed: 2/8/11 12:57

Sample Name: Method Blank
Lab Code: RQ1101312-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020811\0460.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Collected: NA
Date Received: NA
Date Analyzed: 2/8/11 12:57

Sample Name: Method Blank
Lab Code: RQ1101312-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\020811\D0460.D\

Analysis Lot: 235304
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	2/8/11 12:57	
Dibromofluoromethane	106	89-119	2/8/11 12:57	
Toluene-d8	110	87-121	2/8/11 12:57	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Analyzed: 2/ 3/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 234827

Lab Control Sample
 RQ1101159-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.2	20.0	96	72 - 128
1,1,2,2-Tetrachloroethane	21.1	20.0	105	72 - 131
1,1,2-Trichloroethane	18.4	20.0	92	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.6	20.0	108	71 - 134
1,1-Dichloroethane (1,1-DCA)	19.9	20.0	100	76 - 122
1,1-Dichloroethene (1,1-DCE)	18.6	20.0	93	72 - 129
1,2,4-Trichlorobenzene	19.3	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.6	20.0	98	62 - 131
1,2-Dibromoethane	21.0	20.0	105	78 - 125
1,2-Dichlorobenzene	19.2	20.0	96	79 - 124
1,2-Dichloroethane	20.2	20.0	101	78 - 126
1,2-Dichloropropane	19.8	20.0	99	80 - 123
1,3-Dichlorobenzene	19.5	20.0	98	78 - 124
1,4-Dichlorobenzene	19.6	20.0	98	78 - 123
n-Butanol	861	1000	86	70 - 130
2-Butanone (MEK)	19.1	20.0	95	60 - 133
2-Hexanone	19.0	20.0	95	61 - 131
4-Methyl-2-pentanone	18.7	20.0	94	61 - 132
Acetone	15.8	20.0	79	59 - 140
Benzene	19.1	20.0	96	78 - 121
Bromodichloromethane	19.4	20.0	97	80 - 125
Bromoform	18.6	20.0	93	73 - 132
Bromomethane	18.8	20.0	94	57 - 144
Carbon Disulfide	18.2	20.0	91	59 - 138
Carbon Tetrachloride	18.4	20.0	92	69 - 135
Chlorobenzene	19.2	20.0	96	80 - 121
Chloroethane	21.6	20.0	108	71 - 130
Chloroform	19.5	20.0	97	78 - 125
Chloromethane	21.9	20.0	110	62 - 133
Cyclohexane	20.7	20.0	104	67 - 127
Dibromochloromethane	19.1	20.0	95	78 - 133
Dichlorodifluoromethane (CFC 12)	25.4	20.0	127	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 234827

**Lab Control Sample
 RQ1101159-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.1	20.0	96	75 - 125
Ethylbenzene	19.3	20.0	97	78 - 123
Isopropylbenzene (Cumene)	20.8	20.0	104	73 - 133
Methyl Acetate	17.8	20.0	89	57 - 157
Methyl tert-Butyl Ether	18.6	20.0	93	75 - 126
Methylcyclohexane	21.4	20.0	107	64 - 133
Styrene	18.8	20.0	94	80 - 132
Tetrachloroethene (PCE)	18.8	20.0	94	72 - 131
Toluene	18.9	20.0	94	78 - 122
Trichloroethene (TCE)	18.3	20.0	92	74 - 127
Trichlorofluoromethane (CFC 11)	20.1	20.0	101	71 - 139
Vinyl Chloride	23.2	20.0	116	71 - 136
cis-1,2-Dichloroethene	19.4	20.0	97	78 - 122
cis-1,3-Dichloropropene	20.2	20.0	101	77 - 125
m,p-Xylenes	39.6	40.0	99	79 - 126
n-Butyl Acetate	18.3	20.0	91	54 - 127
o-Xylene	19.4	20.0	97	79 - 126
trans-1,2-Dichloroethene	18.7	20.0	94	75 - 121
trans-1,3-Dichloropropene	19.3	20.0	97	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 234829

**Lab Control Sample
 RQ1101213-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.8	20.0	104	72 - 128
1,1,2,2-Tetrachloroethane	21.6	20.0	108	72 - 131
1,1,2-Trichloroethane	21.1	20.0	105	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	23.4	20.0	117	71 - 134
1,1-Dichloroethane (1,1-DCA)	22.2	20.0	111	76 - 122
1,1-Dichloroethene (1,1-DCE)	20.6	20.0	103	72 - 129
1,2,4-Trichlorobenzene	21.7	20.0	109	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.1	20.0	105	62 - 131
1,2-Dibromoethane	21.3	20.0	107	78 - 125
1,2-Dichlorobenzene	21.0	20.0	105	79 - 124
1,2-Dichloroethane	22.7	20.0	113	78 - 126
1,2-Dichloropropane	22.1	20.0	111	80 - 123
1,3-Dichlorobenzene	21.3	20.0	107	78 - 124
1,4-Dichlorobenzene	21.0	20.0	105	78 - 123
n-Butanol	965	1000	97	70 - 130
2-Butanone (MEK)	20.5	20.0	102	60 - 133
2-Hexanone	20.1	20.0	101	61 - 131
4-Methyl-2-pentanone	20.1	20.0	101	61 - 132
Acetone	21.1	20.0	105	59 - 140
Benzene	21.0	20.0	105	78 - 121
Bromodichloromethane	21.5	20.0	107	80 - 125
Bromoform	20.8	20.0	104	73 - 132
Bromomethane	19.9	20.0	100	57 - 144
Carbon Disulfide	18.4	20.0	92	59 - 138
Carbon Tetrachloride	21.1	20.0	105	69 - 135
Chlorobenzene	21.3	20.0	106	80 - 121
Chloroethane	23.9	20.0	120	71 - 130
Chloroform	21.8	20.0	109	78 - 125
Chloromethane	24.4	20.0	122	62 - 133
Cyclohexane	20.5	20.0	103	67 - 127
Dibromochloromethane	21.3	20.0	106	78 - 133
Dichlorodifluoromethane (CFC 12)	27.6	20.0	138	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 234829

**Lab Control Sample
 RQ1101213-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.8	20.0	104	75 - 125
Ethylbenzene	21.3	20.0	106	78 - 123
Isopropylbenzene (Cumene)	23.0	20.0	115	73 - 133
Methyl Acetate	18.9	20.0	94	57 - 157
Methyl tert-Butyl Ether	21.0	20.0	105	75 - 126
Methylcyclohexane	20.7	20.0	103	64 - 133
Styrene	20.8	20.0	104	80 - 132
Tetrachloroethene (PCE)	21.2	20.0	106	72 - 131
Toluene	21.0	20.0	105	78 - 122
Trichloroethene (TCE)	21.4	20.0	107	74 - 127
Trichlorofluoromethane (CFC 11)	22.6	20.0	113	71 - 139
Vinyl Chloride	26.1	20.0	131	71 - 136
cis-1,2-Dichloroethene	21.4	20.0	107	78 - 122
cis-1,3-Dichloropropene	20.6	20.0	103	77 - 125
m,p-Xylenes	43.2	40.0	108	79 - 126
n-Butyl Acetate	19.5	20.0	98	54 - 127
o-Xylene	21.5	20.0	108	79 - 126
trans-1,2-Dichloroethene	21.3	20.0	106	75 - 121
trans-1,3-Dichloropropene	19.8	20.0	99	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 234996

**Lab Control Sample
 RQ1101220-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.0	20.0	105	72 - 128
1,1,2,2-Tetrachloroethane	21.0	20.0	105	72 - 131
1,1,2-Trichloroethane	19.0	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	23.0	20.0	115	71 - 134
1,1-Dichloroethane (1,1-DCA)	22.1	20.0	110	76 - 122
1,1-Dichloroethene (1,1-DCE)	20.8	20.0	104	72 - 129
1,2,4-Trichlorobenzene	19.9	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	18.3	20.0	92	78 - 125
1,2-Dichlorobenzene	19.6	20.0	98	79 - 124
1,2-Dichloroethane	21.1	20.0	105	78 - 126
1,2-Dichloropropane	20.8	20.0	104	80 - 123
1,3-Dichlorobenzene	19.6	20.0	98	78 - 124
1,4-Dichlorobenzene	19.3	20.0	96	78 - 123
n-Butanol	810	1000	81	70 - 130
2-Butanone (MEK)	20.6	20.0	103	60 - 133
2-Hexanone	18.5	20.0	92	61 - 131
4-Methyl-2-pentanone	19.1	20.0	96	61 - 132
Acetone	19.0	20.0	95	59 - 140
Benzene	20.1	20.0	101	78 - 121
Bromodichloromethane	20.3	20.0	101	80 - 125
Bromoform	18.4	20.0	92	73 - 132
Bromomethane	20.5	20.0	102	57 - 144
Carbon Disulfide	18.3	20.0	92	59 - 138
Carbon Tetrachloride	20.4	20.0	102	69 - 135
Chlorobenzene	19.8	20.0	99	80 - 121
Chloroethane	24.6	20.0	123	71 - 130
Chloroform	21.6	20.0	108	78 - 125
Chloromethane	26.4	20.0	132	62 - 133
Cyclohexane	21.6	20.0	108	67 - 127
Dibromochloromethane	18.9	20.0	94	78 - 133
Dichlorodifluoromethane (CFC 12)	29.2	20.0	146 *	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 234996

**Lab Control Sample
 RQ1101220-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.9	20.0	100	75 - 125
Ethylbenzene	20.2	20.0	101	78 - 123
Isopropylbenzene (Cumene)	21.2	20.0	106	73 - 133
Methyl Acetate	19.6	20.0	98	57 - 157
Methyl tert-Butyl Ether	18.9	20.0	95	75 - 126
Methylcyclohexane	22.4	20.0	112	64 - 133
Styrene	19.2	20.0	96	80 - 132
Tetrachloroethene (PCE)	19.7	20.0	98	72 - 131
Toluene	20.4	20.0	102	78 - 122
Trichloroethene (TCE)	19.3	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	23.8	20.0	119	71 - 139
Vinyl Chloride	26.8	20.0	134	71 - 136
cis-1,2-Dichloroethene	20.5	20.0	102	78 - 122
cis-1,3-Dichloropropene	19.5	20.0	98	77 - 125
m,p-Xylenes	40.3	40.0	101	79 - 126
n-Butyl Acetate	18.7	20.0	94	54 - 127
o-Xylene	19.7	20.0	98	79 - 126
trans-1,2-Dichloroethene	20.5	20.0	103	75 - 121
trans-1,3-Dichloropropene	18.8	20.0	94	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1100627
 Date Analyzed: 2/ 8/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235304

Lab Control Sample
 RQ1101312-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.9	20.0	99	72 - 128
1,1,2,2-Tetrachloroethane	18.9	20.0	94	72 - 131
1,1,2-Trichloroethane	18.4	20.0	92	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.9	20.0	109	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.4	20.0	102	76 - 122
1,1-Dichloroethene (1,1-DCE)	18.9	20.0	94	72 - 129
1,2,4-Trichlorobenzene	18.4	20.0	92	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.9	20.0	84	62 - 131
1,2-Dibromoethane	17.8	20.0	89	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	20.3	20.0	101	78 - 126
1,2-Dichloropropane	20.0	20.0	100	80 - 123
1,3-Dichlorobenzene	19.0	20.0	95	78 - 124
1,4-Dichlorobenzene	19.0	20.0	95	78 - 123
n-Butanol	741	1000	74	70 - 130
2-Butanone (MEK)	18.7	20.0	93	60 - 133
2-Hexanone	16.7	20.0	84	61 - 131
4-Methyl-2-pentanone	16.4	20.0	82	61 - 132
Acetone	16.4	20.0	82	59 - 140
Benzene	19.0	20.0	95	78 - 121
Bromodichloromethane	19.5	20.0	98	80 - 125
Bromoform	18.0	20.0	90	73 - 132
Bromomethane	18.3	20.0	92	57 - 144
Carbon Disulfide	17.3	20.0	87	59 - 138
Carbon Tetrachloride	19.6	20.0	98	69 - 135
Chlorobenzene	19.3	20.0	97	80 - 121
Chloroethane	22.1	20.0	110	71 - 130
Chloroform	20.2	20.0	101	78 - 125
Chloromethane	22.2	20.0	111	62 - 133
Cyclohexane	19.7	20.0	99	67 - 127
Dibromochloromethane	18.9	20.0	94	78 - 133
Dichlorodifluoromethane (CFC 12)	26.5	20.0	132	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1100627
Date Analyzed: 2/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 235304

**Lab Control Sample
 RQ1101312-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.7	20.0	93	75 - 125
Ethylbenzene	19.9	20.0	100	78 - 123
Isopropylbenzene (Cumene)	21.4	20.0	107	73 - 133
Methyl Acetate	16.7	20.0	84	57 - 157
Methyl tert-Butyl Ether	17.7	20.0	88	75 - 126
Methylcyclohexane	20.1	20.0	100	64 - 133
Styrene	18.9	20.0	95	80 - 132
Tetrachloroethene (PCE)	19.2	20.0	96	72 - 131
Toluene	19.2	20.0	96	78 - 122
Trichloroethene (TCE)	18.1	20.0	91	74 - 127
Trichlorofluoromethane (CFC 11)	22.1	20.0	110	71 - 139
Vinyl Chloride	24.0	20.0	120	71 - 136
cis-1,2-Dichloroethene	19.2	20.0	96	78 - 122
cis-1,3-Dichloropropene	18.7	20.0	93	77 - 125
m,p-Xylenes	39.5	40.0	99	79 - 126
n-Butyl Acetate	16.5	20.0	83	54 - 127
o-Xylene	19.1	20.0	95	79 - 126
trans-1,2-Dichloroethene	19.2	20.0	96	75 - 121
trans-1,3-Dichloropropene	18.1	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	REMARKS
LC34-BW0003A-024.5-20110201	02/01	1511	-001	GW	3	3	
LC34-BW0003B-031.5-20110201	02/01	1552	-002	GW	3	3	
LC34-BW0003C-038.5-20110202				GW	3	3	
LC34-BW0003D-045.5-20110202				GW	3	3	
LC34-BW0003E-052.5-20110201	02/01	1508	-003	GW	3	3	
LC34-BW0003F-059.5-20110201	02/01	1501	-004	GW	3	3	
TRAP BLANK	01/18	1550	-005	W	3	3	

Analysis Requested

Comments/Special Instructions:

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: 18 Feb

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Rebecca C Duple
 Firm: Geosyntec
 Date/Time: 02/01 1645

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory LaFore
 Firm: CAS
 Date/Time: 2/2/11 1227

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

R1100627
 GeoSyntec Consultants
 ESTCP PED LC34



Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: <u>ESTCP PED LC34</u> Project Number: <u>TR0272</u> Project Manager: <u>Cory Repta</u> Company: <u>Geosyntec</u> Company/Address: <u>6770 South Washington Ave STE #3</u> Phone: <u>321-269-5880</u> City, State, Zip: <u>Titusville, FL 32780</u> FAX: <u>321-269-5880</u> Sampler's Signature: <u>[Signature]</u>		Analysis Requested	
Turnaround Requirements: 24 hr _____ 48 hr _____ 5 BD _____ <input checked="" type="checkbox"/> Standard (15 BD) Provide FAX Preliminary Results Requested Report Date: <u>18 Feb</u>		Number of Containers VOCs (8260C) plus n-butyl acetate	
Report Requirements: I. Routine Report: Results and Method Blank (Surrogate, as required) II. Results w/ QC (Dup., MS, MSD as req) III. Results (with QC and Calibration Summaries) IV. ASP-B V. CLP EDD?: <u>NASA KEDD</u>		Comments/Special Instructions:	
Invoice Information P.O. # _____ Bill to: <u>TR0272</u>		RECEIVED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	
RELINQUISHED BY: Signature: <u>[Signature]</u> Printed Name: <u>Gregory Kufner</u> Firm: <u>CAS</u> Date/Time: <u>2/2/11 1207</u>		RECEIVED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	

Sample I.D.	Date	Time	LAB ID	Matrix	REMARKS
LC34-BW0002A-024.5-20110201	02/01	1419	-0006	GW	3
LC34-BW0002B-031.5-20110201	02/01	1240	-0007	GW	3
LC34-BW0002C-038.5-20110201	02/01	1207	-0008	GW	3
LC34-BW0002D-045.5-20110201	02/01	1038	-0009	GW	3
LC34-BW0002E-052.5-20110201	02/01	0952	-010	GW	3
LC34-BW0002F-059.5-20110201	02/01	0857	-011	GW	3




Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

SR#

PAGE 3 OF 3

Project Name: ESTCPEP LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: 

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-BW0001A-024.5-20110201	8/2/01	0848	-012	GW
LC34-BW0001B-031.5-20110201	8/2/01	0938	-013	GW
LC34-BW0001C-038.5-20110201	8/2/01	1031	-014	GW
LC34-BW0001D-045.5-20110201	8/2/01	1307	-015	GW
LC34-BW0001E-052.5-20110201	8/2/01	1346	-016	GW
LC34-BW0001F-059.5-20110201	8/2/01	1430	-017	GW

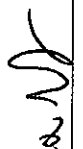
Analysis Requested	Number of Containers	VOCs (8260C) plus n-butyl acetate	REMARKS
	3	3	
	3	3	
	3	3	
	3	3	
	3	3	
	3	3	


TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: 18 Feb

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

Comments/Special Instructions:
R1100627

RELINQUISHED BY:
 Signature: 
 Printed Name: Ruben Chirba
 Firm: Geosyntec
 Date/Time: 02/01/01 1645

RECEIVED BY:
 Signature: 
 Printed Name: Gregory Letour
 Firm: CAS
 Date/Time: 2/2/01 1307

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Cooler Receipt And Preservation Check Form

Project/Client Desynotec Folder Number R1100627

Cooler received on 2/2/11 by: (Signature) COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES (NO)
2. Were custody papers properly filled out (ink, signed, etc.)? (YES) NO
3. Did all bottles arrive in good condition (unbroken)? (YES) NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? (YES) NO
5. Were Ice or Ice packs present? (YES) NO
6. Where did the bottles originate? (CAS/ROC) CLIENT
7. Temperature of cooler(s) upon receipt: 2°

N/A Trip Blank
LC34-BW0003E-052

Is the temperature within 0° - 6° C?: (Yes) Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/2/11 12:31

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 2/2/11

Cooler Breakdown: Date: 2/2/11 Time: 1314 by: Abd

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? (YES) NO
2. Did all bottle labels and tags agree with custody papers? (YES) NO
3. Were correct containers used for the tests indicated? (YES) NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 0-235-002
 Other Comments: _____

PC Secondary Review: KB 2/17/11

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

February 18, 2011

Service Request No: R1100644

Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 2/2/11/ TR0272

Dear Cory:

Enclosed are the results of the sample(s) submitted to our laboratory on February 3, 2011. For your reference, these analyses have been assigned our service request number **R1100644**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Karen Bunker

Karen Bunker
Project Manager

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Client: Geosyntec
Project: ESTCP PED LC34/ TR0272 2/2/11
Sample Matrix: Water

Service Request No.: R1100644
Date Received: 2/3/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Thirteen (13) water samples including one (1) Trip Blank were collected by the client on 2/2/11 and were received for analysis at Columbia Analytical Services on 2/3/11 via a national courier. The samples were received at a cooler temperature of 1.2°C, within the 0-6°C guidelines. Two locations had vials with air bubbles in 1 of the 3 vials received for the samples, no data is affected.

Volatile Organic Compounds by EPA Method 8260C

Water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except the following:

Bromomethane and Dichlorodifluoromethane %Differences (%D) were out at -26.8 %D and -28.1 %D respectively (criteria is $\pm 20\%$) on the 2/7/11 CCV

When CCV %D criteria are not met, it may indicate some bias in the quantitation for that target compound in the associated samples. These compounds were not detected in all samples associated with the outlying CCV's, therefore data was acceptable.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The hits are flagged as "E", estimated. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". Both sets of data are included in the report. Only the "E", estimated values should be used from the diluted reanalysis.

The cis-1,2-Dichloroethene hit for location LC34-IW0076-075.0-20110202 (R1100644-008) is carryover from the hit in the previous location (-007).

Samples were analyzed within 7 days from collection, the holding time for unpreserved vials.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by

 Date 2/22/11

00002

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1100644

<u>Lab ID</u>	<u>Client ID</u>
R1100644-001	LC34-BW0003C-038.5-20110202
R1100644-002	LC34-BW0003D-045.5-20110202
R1100644-003	TRIP BLANK
R1100644-004	LC34-RW0007-038.5-20110202
R1100644-005	LC34-RW0008-052.0-20110202
R1100644-006	LC34-IW0002D-037.5-20110202
R1100644-007	LC34-IW0002D1-052.5-20110202
R1100644-008	LC34-IW0076-075.0-20110202
R1100644-009	LC34-IW0067D-040.5-20110202
R1100644-010	LC34-IW0070D-040.5-20110202
R1100644-011	LC34-IW0070D1-070.0-20110202
R1100644-012	LC34-IW0071D-040.5-20110202
R1100644-013	LC34-IW0071D1-070.0-20110202

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
Connecticut ID # PH0556	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158
Nebraska Accredited	West Virginia ID # 292
Navy Facilities Engineering Service Center Approved	

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1305
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 13:43

Sample Name: LC34-BW0003C-038.5-20110202
Lab Code: R1100644-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\020711\4566.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	30	
79-00-5	1,1,2-Trichloroethane	500 U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500 U	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	43	
106-93-4	1,2-Dibromoethane	500 U	500	30	
95-50-1	1,2-Dichlorobenzene	500 U	500	40	
107-06-2	1,2-Dichloroethane	500 U	500	30	
78-87-5	1,2-Dichloropropane	500 U	500	66	
541-73-1	1,3-Dichlorobenzene	500 U	500	36	
106-46-7	1,4-Dichlorobenzene	500 U	500	34	
71-36-3	n-Butanol	5000 U	5000	670	
78-93-3	2-Butanone (MEK)	1000 U	1000	100	
591-78-6	2-Hexanone	1000 U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	34	
67-64-1	Acetone	160 J	2000	160	
71-43-2	Benzene	500 U	500	31	
75-27-4	Bromodichloromethane	500 U	500	41	
75-25-2	Bromoform	500 U	500	30	
74-83-9	Bromomethane	500 U	500	40	
75-15-0	Carbon Disulfide	1000 U	1000	35	
56-23-5	Carbon Tetrachloride	500 U	500	36	
108-90-7	Chlorobenzene	500 U	500	30	
75-00-3	Chloroethane	500 U	500	30	
67-66-3	Chloroform	500 U	500	30	
74-87-3	Chloromethane	500 U	500	46	
110-82-7	Cyclohexane	1000 U	1000	30	
124-48-1	Dibromochloromethane	500 U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	73	
75-09-2	Dichloromethane	500 U	500	30	
100-41-4	Ethylbenzene	500 U	500	42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1305
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 13:43

Sample Name: LC34-BW0003C-038.5-20110202
Lab Code: R1100644-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4566.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	140	J	500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	2900		500	30	
156-59-2	cis-1,2-Dichloroethene	39000	E	500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	240	J	500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	2/7/11 13:43	
Dibromofluoromethane	105	89-119	2/7/11 13:43	
Toluene-d8	101	87-121	2/7/11 13:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1305
 Date Received: 2/ 3/11
 Date Analyzed: 2/8/11 11:40

Sample Name: LC34-BW0003C-038.5-20110202
 Lab Code: R1100644-001
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA8\DATA\020811\L4590.D\

Analysis Lot: 235245
 Instrument Name: R-MS-08
 Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	75	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	75	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	75	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	100	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	75	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	
106-93-4	1,2-Dibromoethane	1300	U	1300	75	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	100	
107-06-2	1,2-Dichloroethane	1300	U	1300	75	
78-87-5	1,2-Dichloropropane	1300	U	1300	170	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	90	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	85	
71-36-3	n-Butanol	13000	U	13000	1700	
78-93-3	2-Butanone (MEK)	2500	U	2500	250	
591-78-6	2-Hexanone	2500	U	2500	100	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	85	
67-64-1	Acetone	5000	U	5000	400	
71-43-2	Benzene	1300	U	1300	78	
75-27-4	Bromodichloromethane	1300	U	1300	110	
75-25-2	Bromoform	1300	U	1300	75	
74-83-9	Bromomethane	1300	U	1300	100	
75-15-0	Carbon Disulfide	2500	U	2500	88	
56-23-5	Carbon Tetrachloride	1300	U	1300	90	
108-90-7	Chlorobenzene	1300	U	1300	75	
75-00-3	Chloroethane	1300	U	1300	75	
67-66-3	Chloroform	1300	U	1300	75	
74-87-3	Chloromethane	1300	U	1300	120	
110-82-7	Cyclohexane	2500	U	2500	75	
124-48-1	Dibromochloromethane	1300	U	1300	75	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	
75-09-2	Dichloromethane	1300	U	1300	75	
100-41-4	Ethylbenzene	1300	U	1300	110	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1305
Date Received: 2/ 3/11
Date Analyzed: 2/8/11 11:40

Sample Name: LC34-BW0003C-038.5-20110202
Lab Code: R1100644-001
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\L4590.D\

Analysis Lot: 235245
Instrument Name: R-MS-08
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	85	
79-20-9	Methyl Acetate	2500	U	2500	170	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	75	
108-87-2	Methylcyclohexane	2500	U	2500	75	
100-42-5	Styrene	1300	U	1300	88	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	110	
108-88-3	Toluene	1300	U	1300	75	
79-01-6	Trichloroethene (TCE)	170	DJ	1300	75	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	75	
75-01-4	Vinyl Chloride	2900	D	1300	75	
156-59-2	cis-1,2-Dichloroethene	36000	D	1300	75	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	75	
179601-23-1	m,p-Xylenes	1300	U	1300	210	
123-86-4	n-Butyl Acetate	1300	U	1300	75	
95-47-6	o-Xylene	1300	U	1300	100	
156-60-5	trans-1,2-Dichloroethene	240	DJ	1300	75	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	75	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	2/8/11 11:40	
Dibromofluoromethane	106	89-119	2/8/11 11:40	
Toluene-d8	101	87-121	2/8/11 11:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1335
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 14:11

Sample Name: LC34-BW0003D-045.5-20110202
 Lab Code: R1100644-002

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\L4567.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	30	
79-00-5	1,1,2-Trichloroethane	500 U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	220 J	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	43	
106-93-4	1,2-Dibromoethane	500 U	500	30	
95-50-1	1,2-Dichlorobenzene	500 U	500	40	
107-06-2	1,2-Dichloroethane	500 U	500	30	
78-87-5	1,2-Dichloropropane	500 U	500	66	
541-73-1	1,3-Dichlorobenzene	500 U	500	36	
106-46-7	1,4-Dichlorobenzene	500 U	500	34	
71-36-3	n-Butanol	5000 U	5000	670	
78-93-3	2-Butanone (MEK)	1000 U	1000	100	
591-78-6	2-Hexanone	1000 U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	34	
67-64-1	Acetone	2000 U	2000	160	
71-43-2	Benzene	500 U	500	31	
75-27-4	Bromodichloromethane	500 U	500	41	
75-25-2	Bromoform	500 U	500	30	
74-83-9	Bromomethane	500 U	500	40	
75-15-0	Carbon Disulfide	1000 U	1000	35	
56-23-5	Carbon Tetrachloride	500 U	500	36	
108-90-7	Chlorobenzene	500 U	500	30	
75-00-3	Chloroethane	500 U	500	30	
67-66-3	Chloroform	500 U	500	30	
74-87-3	Chloromethane	500 U	500	46	
110-82-7	Cyclohexane	1000 U	1000	30	
124-48-1	Dibromochloromethane	500 U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	73	
75-09-2	Dichloromethane	500 U	500	30	
100-41-4	Ethylbenzene	500 U	500	42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1335
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 14:11

Sample Name: LC34-BW0003D-045.5-20110202
Lab Code: R1100644-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4567.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	7800		500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	410	J	500	30	
156-59-2	cis-1,2-Dichloroethene	17000		500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	79	J	500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	2/7/11 14:11	
Dibromofluoromethane	109	89-119	2/7/11 14:11	
Toluene-d8	103	87-121	2/7/11 14:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1550
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 13:16

Sample Name: TRIP BLANK
 Lab Code: R1100644-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\MSVOA8\DATA\020711\4565.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1550
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 13:16

Sample Name: TRIP BLANK
Lab Code: R1100644-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4565.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/7/11 13:16	
Dibromofluoromethane	104	89-119	2/7/11 13:16	
Toluene-d8	99	87-121	2/7/11 13:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1555
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 14:38

Sample Name: LC34-RW0007-038.5-20110202
 Lab Code: R1100644-004

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4568.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 200

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000 U	1000	60	
79-34-5	1,1,2,2-Tetrachloroethane	1000 U	1000	60	
79-00-5	1,1,2-Trichloroethane	1000 U	1000	60	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13000	1000	80	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000 U	1000	60	
75-35-4	1,1-Dichloroethene (1,1-DCE)	74 J	1000	74	
120-82-1	1,2,4-Trichlorobenzene	1000 U	1000	60	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000 U	1000	86	
106-93-4	1,2-Dibromoethane	1000 U	1000	60	
95-50-1	1,2-Dichlorobenzene	1000 U	1000	80	
107-06-2	1,2-Dichloroethane	1000 U	1000	60	
78-87-5	1,2-Dichloropropane	1000 U	1000	140	
541-73-1	1,3-Dichlorobenzene	1000 U	1000	72	
106-46-7	1,4-Dichlorobenzene	1000 U	1000	68	
71-36-3	n-Butanol	10000 U	10000	1400	
78-93-3	2-Butanone (MEK)	2000 U	2000	200	
591-78-6	2-Hexanone	2000 U	2000	80	
108-10-1	4-Methyl-2-pentanone	2000 U	2000	68	
67-64-1	Acetone	4000 U	4000	320	
71-43-2	Benzene	1000 U	1000	62	
75-27-4	Bromodichloromethane	1000 U	1000	82	
75-25-2	Bromoform	1000 U	1000	60	
74-83-9	Bromomethane	1000 U	1000	80	
75-15-0	Carbon Disulfide	2000 U	2000	70	
56-23-5	Carbon Tetrachloride	1000 U	1000	72	
108-90-7	Chlorobenzene	1000 U	1000	60	
75-00-3	Chloroethane	1000 U	1000	60	
67-66-3	Chloroform	180 J	1000	60	
74-87-3	Chloromethane	1000 U	1000	92	
110-82-7	Cyclohexane	2000 U	2000	60	
124-48-1	Dibromochloromethane	1000 U	1000	60	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000 U	1000	150	
75-09-2	Dichloromethane	1000 U	1000	60	
100-41-4	Ethylbenzene	1000 U	1000	84	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1555
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 14:38

Sample Name: LC34-RW0007-038.5-20110202
Lab Code: R1100644-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\020711\L4568.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	68	
79-20-9	Methyl Acetate	2000	U	2000	140	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	60	
108-87-2	Methylcyclohexane	2000	U	2000	60	
100-42-5	Styrene	1000	U	1000	70	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	84	
108-88-3	Toluene	1000	U	1000	60	
79-01-6	Trichloroethene (TCE)	53000	E	1000	60	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	60	
75-01-4	Vinyl Chloride	1000	U	1000	60	
156-59-2	cis-1,2-Dichloroethene	52000	E	1000	60	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	60	
179601-23-1	m,p-Xylenes	1000	U	1000	170	
123-86-4	n-Butyl Acetate	1000	U	1000	60	
95-47-6	o-Xylene	1000	U	1000	80	
156-60-5	trans-1,2-Dichloroethene	300	J	1000	60	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	60	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	2/7/11 14:38	
Dibromofluoromethane	109	89-119	2/7/11 14:38	
Toluene-d8	102	87-121	2/7/11 14:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1555
 Date Received: 2/ 3/11
 Date Analyzed: 2/8/11 12:07

Sample Name: LC34-RW0007-038.5-20110202
 Lab Code: R1100644-004
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\4591.D\

Analysis Lot: 235245
 Instrument Name: R-MS-08
 Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500 U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500 U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500 U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	14000 D	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500 U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500 U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500 U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500 U	2500	220	
106-93-4	1,2-Dibromoethane	2500 U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500 U	2500	200	
107-06-2	1,2-Dichloroethane	2500 U	2500	150	
78-87-5	1,2-Dichloropropane	2500 U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500 U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500 U	2500	170	
71-36-3	n-Butanol	25000 U	25000	3400	
78-93-3	2-Butanone (MEK)	5000 U	5000	500	
591-78-6	2-Hexanone	5000 U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000 U	5000	170	
67-64-1	Acetone	10000 U	10000	800	
71-43-2	Benzene	2500 U	2500	160	
75-27-4	Bromodichloromethane	2500 U	2500	210	
75-25-2	Bromoform	2500 U	2500	150	
74-83-9	Bromomethane	2500 U	2500	200	
75-15-0	Carbon Disulfide	5000 U	5000	180	
56-23-5	Carbon Tetrachloride	2500 U	2500	180	
108-90-7	Chlorobenzene	2500 U	2500	150	
75-00-3	Chloroethane	2500 U	2500	150	
67-66-3	Chloroform	2500 U	2500	150	
74-87-3	Chloromethane	2500 U	2500	230	
110-82-7	Cyclohexane	5000 U	5000	150	
124-48-1	Dibromochloromethane	2500 U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500 U	2500	370	
75-09-2	Dichloromethane	2500 U	2500	150	
100-41-4	Ethylbenzene	2500 U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1555
Date Received: 2/ 3/11
Date Analyzed: 2/8/11 12:07

Sample Name: LC34-RW0007-038.5-20110202
Lab Code: R1100644-004
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\020811\L4591.D\

Analysis Lot: 235245
Instrument Name: R-MS-08
Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500 U	2500	170	
79-20-9	Methyl Acetate	5000 U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500 U	2500	150	
108-87-2	Methylcyclohexane	5000 U	5000	150	
100-42-5	Styrene	2500 U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500 U	2500	210	
108-88-3	Toluene	2500 U	2500	150	
79-01-6	Trichloroethene (TCE)	54000 D	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500 U	2500	150	
75-01-4	Vinyl Chloride	2500 U	2500	150	
156-59-2	cis-1,2-Dichloroethene	50000 D	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500 U	2500	150	
179601-23-1	m,p-Xylenes	2500 U	2500	410	
123-86-4	n-Butyl Acetate	2500 U	2500	150	
95-47-6	o-Xylene	2500 U	2500	200	
156-60-5	trans-1,2-Dichloroethene	300 DJ	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500 U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/8/11 12:07	
Dibromofluoromethane	103	89-119	2/8/11 12:07	
Toluene-d8	99	87-121	2/8/11 12:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1515
 Date Received: 2/ 3/11
 Date Analyzed: 2/8/11 12:35

Sample Name: LC34-RW0008-052.0-20110202
 Lab Code: R1100644-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\L4592.D\

Analysis Lot: 235245
 Instrument Name: R-MS-08
 Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	7.5	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	7.5	
79-00-5	1,1,2-Trichloroethane	130	U	130	7.5	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	620		130	10	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	7.5	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130	U	130	9.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	7.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	11	
106-93-4	1,2-Dibromoethane	130	U	130	7.5	
95-50-1	1,2-Dichlorobenzene	130	U	130	10	
107-06-2	1,2-Dichloroethane	130	U	130	7.5	
78-87-5	1,2-Dichloropropane	130	U	130	17	
541-73-1	1,3-Dichlorobenzene	130	U	130	9.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	8.5	
71-36-3	n-Butanol	1300	U	1300	170	
78-93-3	2-Butanone (MEK)	250	U	250	25	
591-78-6	2-Hexanone	250	U	250	10	
108-10-1	4-Methyl-2-pentanone	250	U	250	8.5	
67-64-1	Acetone	500	U	500	40	
71-43-2	Benzene	130	U	130	7.8	
75-27-4	Bromodichloromethane	130	U	130	11	
75-25-2	Bromoform	130	U	130	7.5	
74-83-9	Bromomethane	130	U	130	10	
75-15-0	Carbon Disulfide	250	U	250	8.8	
56-23-5	Carbon Tetrachloride	130	U	130	9.0	
108-90-7	Chlorobenzene	130	U	130	7.5	
75-00-3	Chloroethane	130	U	130	7.5	
67-66-3	Chloroform	7.5	J	130	7.5	
74-87-3	Chloromethane	130	U	130	12	
110-82-7	Cyclohexane	250	U	250	7.5	
124-48-1	Dibromochloromethane	130	U	130	7.5	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	19	
75-09-2	Dichloromethane	130	U	130	7.5	
100-41-4	Ethylbenzene	130	U	130	11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1515
Date Received: 2/ 3/11
Date Analyzed: 2/8/11 12:35

Sample Name: LC34-RW0008-052.0-20110202
Lab Code: R1100644-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\L4592.D\

Analysis Lot: 235245
Instrument Name: R-MS-08
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	130	U	130	8.5	
79-20-9	Methyl Acetate	250	U	250	17	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	7.5	
108-87-2	Methylcyclohexane	250	U	250	7.5	
100-42-5	Styrene	130	U	130	8.8	
127-18-4	Tetrachloroethene (PCE)	130	U	130	11	
108-88-3	Toluene	130	U	130	7.5	
79-01-6	Trichloroethene (TCE)	4900		130	7.5	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	7.5	
75-01-4	Vinyl Chloride	18	J	130	7.5	
156-59-2	cis-1,2-Dichloroethene	3300		130	7.5	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	7.5	
179601-23-1	m,p-Xylenes	130	U	130	21	
123-86-4	n-Butyl Acetate	130	U	130	7.5	
95-47-6	o-Xylene	130	U	130	10	
156-60-5	trans-1,2-Dichloroethene	20	J	130	7.5	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	7.5	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	2/8/11 12:35	
Dibromofluoromethane	106	89-119	2/8/11 12:35	
Toluene-d8	101	87-121	2/8/11 12:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1459
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 15:33

Sample Name: LC34-IW0002D-037.5-20110202
 Lab Code: R1100644-006

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4570.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	30	
79-00-5	1,1,2-Trichloroethane	500 U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500 U	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	43	
106-93-4	1,2-Dibromoethane	500 U	500	30	
95-50-1	1,2-Dichlorobenzene	500 U	500	40	
107-06-2	1,2-Dichloroethane	500 U	500	30	
78-87-5	1,2-Dichloropropane	500 U	500	66	
541-73-1	1,3-Dichlorobenzene	500 U	500	36	
106-46-7	1,4-Dichlorobenzene	500 U	500	34	
71-36-3	n-Butanol	5000 U	5000	670	
78-93-3	2-Butanone (MEK)	1000 U	1000	100	
591-78-6	2-Hexanone	1000 U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	34	
67-64-1	Acetone	2000 U	2000	160	
71-43-2	Benzene	500 U	500	31	
75-27-4	Bromodichloromethane	500 U	500	41	
75-25-2	Bromoform	500 U	500	30	
74-83-9	Bromomethane	500 U	500	40	
75-15-0	Carbon Disulfide	1000 U	1000	35	
56-23-5	Carbon Tetrachloride	500 U	500	36	
108-90-7	Chlorobenzene	500 U	500	30	
75-00-3	Chloroethane	500 U	500	30	
67-66-3	Chloroform	54 J	500	30	
74-87-3	Chloromethane	500 U	500	46	
110-82-7	Cyclohexane	1000 U	1000	30	
124-48-1	Dibromochloromethane	500 U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	73	
75-09-2	Dichloromethane	500 U	500	30	
100-41-4	Ethylbenzene	500 U	500	42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1459
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 15:33

Sample Name: LC34-IW0002D-037.5-20110202
Lab Code: R1100644-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4570.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	17000		500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	170	J	500	30	
156-59-2	cis-1,2-Dichloroethene	64000	E	500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	390	J	500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/7/11 15:33	
Dibromofluoromethane	105	89-119	2/7/11 15:33	
Toluene-d8	101	87-121	2/7/11 15:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1459
 Date Received: 2/ 3/11
 Date Analyzed: 2/8/11 13:02

Sample Name: LC34-IW0002D-037.5-20110202
 Lab Code: R1100644-006
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\L4593.D\

Analysis Lot: 235245
 Instrument Name: R-MS-08
 Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500 U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500 U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500 U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2500 U	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500 U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500 U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500 U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500 U	2500	220	
106-93-4	1,2-Dibromoethane	2500 U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500 U	2500	200	
107-06-2	1,2-Dichloroethane	2500 U	2500	150	
78-87-5	1,2-Dichloropropane	2500 U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500 U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500 U	2500	170	
71-36-3	n-Butanol	25000 U	25000	3400	
78-93-3	2-Butanone (MEK)	5000 U	5000	500	
591-78-6	2-Hexanone	5000 U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000 U	5000	170	
67-64-1	Acetone	10000 U	10000	800	
71-43-2	Benzene	2500 U	2500	160	
75-27-4	Bromodichloromethane	2500 U	2500	210	
75-25-2	Bromoform	2500 U	2500	150	
74-83-9	Bromomethane	2500 U	2500	200	
75-15-0	Carbon Disulfide	5000 U	5000	180	
56-23-5	Carbon Tetrachloride	2500 U	2500	180	
108-90-7	Chlorobenzene	2500 U	2500	150	
75-00-3	Chloroethane	2500 U	2500	150	
67-66-3	Chloroform	460 DJ	2500	150	
74-87-3	Chloromethane	2500 U	2500	230	
110-82-7	Cyclohexane	5000 U	5000	150	
124-48-1	Dibromochloromethane	2500 U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500 U	2500	370	
75-09-2	Dichloromethane	2500 U	2500	150	
100-41-4	Ethylbenzene	2500 U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1459
Date Received: 2/ 3/11
Date Analyzed: 2/8/11 13:02

Sample Name: LC34-IW0002D-037.5-20110202
Lab Code: R1100644-006
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\4593.D\

Analysis Lot: 235245
Instrument Name: R-MS-08
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	17000	D	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	170	DJ	2500	150	
156-59-2	cis-1,2-Dichloroethene	57000	D	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	370	DJ	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/8/11 13:02	
Dibromofluoromethane	103	89-119	2/8/11 13:02	
Toluene-d8	100	87-121	2/8/11 13:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/2/11 1423
 Date Received: 2/3/11
 Date Analyzed: 2/7/11 16:00

Sample Name: LC34-IW0002D1-052.5-20110202
 Lab Code: R1100644-007

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\VL4571.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	3.0	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	3.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	3.0	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	52		50	4.0	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	3.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	3.7	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	3.0	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	4.3	
106-93-4	1,2-Dibromoethane	50	U	50	3.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	4.0	
107-06-2	1,2-Dichloroethane	50	U	50	3.0	
78-87-5	1,2-Dichloropropane	50	U	50	6.7	
541-73-1	1,3-Dichlorobenzene	50	U	50	3.6	
106-46-7	1,4-Dichlorobenzene	50	U	50	3.5	
71-36-3	n-Butanol	500	U	500	67	
78-93-3	2-Butanone (MEK)	100	U	100	10	
591-78-6	2-Hexanone	100	U	100	4.0	
108-10-1	4-Methyl-2-pentanone	100	U	100	3.5	
67-64-1	Acetone	200	U	200	16	
71-43-2	Benzene	50	U	50	3.1	
75-27-4	Bromodichloromethane	50	U	50	4.1	
75-25-2	Bromoform	50	U	50	3.0	
74-83-9	Bromomethane	50	U	50	4.0	
75-15-0	Carbon Disulfide	100	U	100	3.5	
56-23-5	Carbon Tetrachloride	50	U	50	3.6	
108-90-7	Chlorobenzene	50	U	50	3.0	
75-00-3	Chloroethane	50	U	50	3.0	
67-66-3	Chloroform	50	U	50	3.0	
74-87-3	Chloromethane	50	U	50	4.7	
110-82-7	Cyclohexane	100	U	100	3.0	
124-48-1	Dibromochloromethane	50	U	50	3.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	7.3	
75-09-2	Dichloromethane	50	U	50	3.0	
100-41-4	Ethylbenzene	50	U	50	4.2	
98-82-8	Isopropylbenzene (Cumene)	50	U	50	3.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/2/11 1423
Date Received: 2/3/11
Date Analyzed: 2/7/11 16:00

Sample Name: LC34-IW0002D1-052.5-20110202
Lab Code: R1100644-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\020711\4571.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	100	U	100	6.7	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	3.0	
108-87-2	Methylcyclohexane	100	U	100	3.0	
100-42-5	Styrene	50	U	50	3.5	
127-18-4	Tetrachloroethene (PCE)	50	U	50	4.2	
108-88-3	Toluene	50	U	50	3.0	
79-01-6	Trichloroethene (TCE)	760		50	3.0	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	3.0	
75-01-4	Vinyl Chloride	6.4	J	50	3.0	
156-59-2	cis-1,2-Dichloroethene	1200		50	3.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	3.0	
179601-23-1	m,p-Xylenes	50	U	50	8.2	
123-86-4	n-Butyl Acetate	50	U	50	3.0	
95-47-6	o-Xylene	50	U	50	4.0	
156-60-5	trans-1,2-Dichloroethene	6.3	J	50	3.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	3.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/7/11 16:00	
Dibromofluoromethane	105	89-119	2/7/11 16:00	
Toluene-d8	101	87-121	2/7/11 16:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1554
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 16:27

Sample Name: LC34-IW0076-075.0-20110202
 Lab Code: R1100644-008

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4572.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1554
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 16:27

Sample Name: LC34-IW0076-075.0-20110202
Lab Code: R1100644-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\020711\4572.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	0.40	J	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	2/7/11 16:27	
Dibromofluoromethane	109	89-119	2/7/11 16:27	
Toluene-d8	105	87-121	2/7/11 16:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1058
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 16:55

Sample Name: LC34-IW0067D-040.5-20110202
Lab Code: R1100644-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\L4573.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1058
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 16:55

Sample Name: LC34-IW0067D-040.5-20110202
Lab Code: R1100644-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4573.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/7/11 16:55	
Dibromofluoromethane	104	89-119	2/7/11 16:55	
Toluene-d8	98	87-121	2/7/11 16:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1307
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 17:22

Sample Name: LC34-IW0070D-040.5-20110202
Lab Code: R1100644-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\020711\L4574.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1307
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 17:22

Sample Name: LC34-IW0070D-040.5-20110202
Lab Code: R1100644-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4574.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/7/11 17:22	
Dibromofluoromethane	103	89-119	2/7/11 17:22	
Toluene-d8	98	87-121	2/7/11 17:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/2/11 1333
 Date Received: 2/3/11
 Date Analyzed: 2/7/11 17:49

Sample Name: LC34-IW0070D1-070.0-20110202
 Lab Code: R1100644-011

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4575.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/2/11 1333
Date Received: 2/3/11
Date Analyzed: 2/7/11 17:49

Sample Name: LC34-IW0070D1-070.0-20110202
Lab Code: R1100644-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQDATA\MSVOA8\DATA\020711\VL4575.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	2/7/11 17:49	
Dibromofluoromethane	104	89-119	2/7/11 17:49	
Toluene-d8	99	87-121	2/7/11 17:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/ 2/11 1100
 Date Received: 2/ 3/11
 Date Analyzed: 2/7/11 18:17

Sample Name: LC34-IW0071D-040.5-20110202
 Lab Code: R1100644-012

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\4576.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/ 2/11 1100
Date Received: 2/ 3/11
Date Analyzed: 2/7/11 18:17

Sample Name: LC34-IW0071D-040.5-20110202
Lab Code: R1100644-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\020711\4576.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/7/11 18:17	
Dibromofluoromethane	103	89-119	2/7/11 18:17	
Toluene-d8	97	87-121	2/7/11 18:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: 2/2/11 1125
 Date Received: 2/3/11
 Date Analyzed: 2/7/11 18:44

Sample Name: LC34-IW0071D1-070.0-20110202
 Lab Code: R1100644-013

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA8\DATA\020711\4577.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: 2/2/11 1125
Date Received: 2/3/11
Date Analyzed: 2/7/11 18:44

Sample Name: LC34-IW0071D1-070.0-20110202
Lab Code: R1100644-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\020711\4577.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	2/7/11 18:44	
Dibromofluoromethane	106	89-119	2/7/11 18:44	
Toluene-d8	101	87-121	2/7/11 18:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/7/11 11:27

Sample Name: Method Blank
 Lab Code: RQ1101185-03

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\NL4561.D\

Analysis Lot: 235135
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: NA
Date Received: NA
Date Analyzed: 2/7/11 11:27

Sample Name: Method Blank
Lab Code: RQ1101185-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020711\L4561.D\

Analysis Lot: 235135
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/7/11 11:27	
Dibromofluoromethane	104	89-119	2/7/11 11:27	
Toluene-d8	102	87-121	2/7/11 11:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/8/11 11:13

Sample Name: Method Blank
 Lab Code: RQ1101211-03

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\4589.D\

Analysis Lot: 235245
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.34	
71-36-3	n-Butanol	50	U	50	6.7	
78-93-3	2-Butanone (MEK)	10	U	10	1.0	
591-78-6	2-Hexanone	10	U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.34	
67-64-1	Acetone	20	U	20	1.6	
71-43-2	Benzene	5.0	U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.41	
75-25-2	Bromoform	5.0	U	5.0	0.30	
74-83-9	Bromomethane	5.0	U	5.0	0.40	
75-15-0	Carbon Disulfide	10	U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.36	
108-90-7	Chlorobenzene	5.0	U	5.0	0.30	
75-00-3	Chloroethane	5.0	U	5.0	0.30	
67-66-3	Chloroform	5.0	U	5.0	0.30	
74-87-3	Chloromethane	5.0	U	5.0	0.46	
110-82-7	Cyclohexane	10	U	10	0.30	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	
75-09-2	Dichloromethane	5.0	U	5.0	0.30	
100-41-4	Ethylbenzene	5.0	U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Collected: NA
Date Received: NA
Date Analyzed: 2/8/11 11:13

Sample Name: Method Blank
Lab Code: RQ1101211-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\020811\4589.D\

Analysis Lot: 235245
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	2/8/11 11:13	
Dibromofluoromethane	106	89-119	2/8/11 11:13	
Toluene-d8	102	87-121	2/8/11 11:13	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/2/11/ TR0272
 Sample Matrix: Water

Service Request: R1100644
 Date Analyzed: 2/ 7/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235135

Lab Control Sample
 RQ1101185-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.2	20.0	96	72 - 128
1,1,2,2-Tetrachloroethane	18.9	20.0	94	72 - 131
1,1,2-Trichloroethane	20.5	20.0	103	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.6	20.0	103	71 - 134
1,1-Dichloroethane (1,1-DCA)	21.2	20.0	106	76 - 122
1,1-Dichloroethene (1,1-DCE)	20.1	20.0	100	72 - 129
1,2,4-Trichlorobenzene	19.1	20.0	95	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.0	20.0	105	62 - 131
1,2-Dibromoethane	20.2	20.0	101	78 - 125
1,2-Dichlorobenzene	19.2	20.0	96	79 - 124
1,2-Dichloroethane	21.0	20.0	105	78 - 126
1,2-Dichloropropane	20.5	20.0	103	80 - 123
1,3-Dichlorobenzene	19.2	20.0	96	78 - 124
1,4-Dichlorobenzene	19.1	20.0	95	78 - 123
n-Butanol	1120	1000	112	70 - 130
2-Butanone (MEK)	19.5	20.0	98	60 - 133
2-Hexanone	19.8	20.0	99	61 - 131
4-Methyl-2-pentanone	20.2	20.0	101	61 - 132
Acetone	22.4	20.0	112	59 - 140
Benzene	20.5	20.0	102	78 - 121
Bromodichloromethane	20.7	20.0	103	80 - 125
Bromoform	19.8	20.0	99	73 - 132
Bromomethane	17.4	20.0	87	57 - 144
Carbon Disulfide	20.8	20.0	104	59 - 138
Carbon Tetrachloride	19.5	20.0	97	69 - 135
Chlorobenzene	19.7	20.0	98	80 - 121
Chloroethane	22.6	20.0	113	71 - 130
Chloroform	19.9	20.0	99	78 - 125
Chloromethane	22.2	20.0	111	62 - 133
Cyclohexane	19.0	20.0	95	67 - 127
Dibromochloromethane	20.3	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	20.7	20.0	104	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Analyzed: 2/ 7/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 235135

**Lab Control Sample
 RQ1101185-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.2	20.0	101	75 - 125
Ethylbenzene	20.4	20.0	102	78 - 123
Isopropylbenzene (Cumene)	22.0	20.0	110	73 - 133
Methyl Acetate	17.9	20.0	90	57 - 157
Methyl tert-Butyl Ether	19.9	20.0	99	75 - 126
Methylcyclohexane	18.1	20.0	91	64 - 133
Styrene	19.2	20.0	96	80 - 132
Tetrachloroethene (PCE)	20.6	20.0	103	72 - 131
Toluene	20.4	20.0	102	78 - 122
Trichloroethene (TCE)	19.9	20.0	100	74 - 127
Trichlorofluoromethane (CFC 11)	18.9	20.0	95	71 - 139
Vinyl Chloride	24.3	20.0	122	71 - 136
cis-1,2-Dichloroethene	21.1	20.0	106	78 - 122
cis-1,3-Dichloropropene	20.3	20.0	101	77 - 125
m,p-Xylenes	40.1	40.0	100	79 - 126
n-Butyl Acetate	18.5	20.0	92	54 - 127
o-Xylene	19.8	20.0	99	79 - 126
trans-1,2-Dichloroethene	20.4	20.0	102	75 - 121
trans-1,3-Dichloropropene	19.9	20.0	100	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Analyzed: 2/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235245

**Lab Control Sample
 RQ1101211-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.6	20.0	103	72 - 128
1,1,2,2-Tetrachloroethane	18.2	20.0	91	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.5	20.0	108	71 - 134
1,1-Dichloroethane (1,1-DCA)	22.1	20.0	110	76 - 122
1,1-Dichloroethene (1,1-DCE)	21.5	20.0	107	72 - 129
1,2,4-Trichlorobenzene	19.5	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.5	20.0	97	62 - 131
1,2-Dibromoethane	20.0	20.0	100	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	22.3	20.0	112	78 - 126
1,2-Dichloropropane	21.8	20.0	109	80 - 123
1,3-Dichlorobenzene	19.1	20.0	96	78 - 124
1,4-Dichlorobenzene	19.1	20.0	96	78 - 123
n-Butanol	1260	1000	126	70 - 130
2-Butanone (MEK)	18.9	20.0	94	60 - 133
2-Hexanone	20.4	20.0	102	61 - 131
4-Methyl-2-pentanone	20.6	20.0	103	61 - 132
Acetone	18.4	20.0	92	59 - 140
Benzene	21.5	20.0	108	78 - 121
Bromodichloromethane	21.8	20.0	109	80 - 125
Bromoform	19.2	20.0	96	73 - 132
Bromomethane	19.9	20.0	100	57 - 144
Carbon Disulfide	19.5	20.0	98	59 - 138
Carbon Tetrachloride	20.9	20.0	104	69 - 135
Chlorobenzene	19.6	20.0	98	80 - 121
Chloroethane	23.2	20.0	116	71 - 130
Chloroform	21.0	20.0	105	78 - 125
Chloromethane	23.9	20.0	120	62 - 133
Cyclohexane	20.1	20.0	101	67 - 127
Dibromochloromethane	20.7	20.0	103	78 - 133
Dichlorodifluoromethane (CFC 12)	22.1	20.0	110	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/2/11/ TR0272
Sample Matrix: Water

Service Request: R1100644
Date Analyzed: 2/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 235245

**Lab Control Sample
 RQ1101211-04**


Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.5	20.0	107	75 - 125
Ethylbenzene	20.7	20.0	103	78 - 123
Isopropylbenzene (Cumene)	21.8	20.0	109	73 - 133
Methyl Acetate	19.0	20.0	95	57 - 157
Methyl tert-Butyl Ether	20.6	20.0	103	75 - 126
Methylcyclohexane	19.2	20.0	96	64 - 133
Styrene	18.9	20.0	95	80 - 132
Tetrachloroethene (PCE)	20.4	20.0	102	72 - 131
Toluene	20.1	20.0	100	78 - 122
Trichloroethene (TCE)	21.3	20.0	106	74 - 127
Trichlorofluoromethane (CFC 11)	20.4	20.0	102	71 - 139
Vinyl Chloride	26.3	20.0	132	71 - 136
cis-1,2-Dichloroethene	21.8	20.0	109	78 - 122
cis-1,3-Dichloropropene	20.8	20.0	104	77 - 125
m,p-Xylenes	39.9	40.0	100	79 - 126
n-Butyl Acetate	17.9	20.0	89	54 - 127
o-Xylene	20.1	20.0	100	79 - 126
trans-1,2-Dichloroethene	20.9	20.0	105	75 - 121
trans-1,3-Dichloropropene	20.5	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: <u>ESTCP PED LC34</u> Project Number: <u>TR0272</u> Project Manager: <u>Cory Repta</u> Company: <u>Geosyntec</u> Company/Address: <u>6770 South Washington Ave STE #3</u> Phone: <u>321-269-5880</u> City, State, Zip: <u>Titusville FL 32780</u> FAX: <u>321-269-5880</u> Sampler's Signature: <u><i>Janeet Barfyu</i></u>		Analysis Requested			
	Number of Containers VOCs (8260C) plus n-butyl acetate				
Sample I.D. Date Time LAB ID Matrix REMARKS	B034-BW0002A-024.5-201102 B034-BW0002B-031.5-201102 LC34-BW0003C-038.5-20110202 LC34-BW0003D-045.5-20110202 B034-BW0003E-052.5-201102 LC34-BW0003F-059.5-201102 TRIP BEANK	2/9/11 1305 2/12/11 1335 1/12/11 1558	001 UB 001 002 003	GW GW GW GW GW W	
TURNAROUND REQUIREMENTS 24 hr _____ 48 hr _____ 5 BD _____ <input checked="" type="checkbox"/> Standard (15 BD) Provide FAX Preliminary Results Requested Report Date: <u>18 Feb</u>		REPORT REQUIREMENTS I. Routine Report: Results and Method Blank (Surrogate, as required) II. Results w/ QC (Dup., MS, MSD as req) III. Results (with QC and Calibration Summaries) IV. ASP-B V. CLP EDD?: <u>NASA KEDD</u>			
Invoice Information P.O. # _____ Bill to: <u>TR0272</u>		Comments/Special Instructions: RECEIVED BY: <u><i>Christine Kuster</i></u> Signature: _____ Printed Name: <u>Christine Kuster</u> Firm: <u>CAS</u> Date/Time: <u>2/3/11 0933</u>			
RELINQUISHED BY: Signature: <u><i>Janeet Barfyu</i></u> Printed Name: <u>JANEET BARFYU</u> Firm: <u>Geosyntec</u> Date/Time: <u>2/9/11 1640</u>		RECEIVED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____			
R1100644 Geosyntec Consultants ESTCP PED LC34 2/2/11 		RECEIVED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____			

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	Analysis Requested	REMARKS
LC34-RW0007-038.5-20110202	2/2/11	1555	-0074	GW	3	3		
LC34-RW0008-052.0-20110202	2/2/11	1515	-305	GW	3	3		
LC34-RW0009-057.5-20110202				GW	3	3		
LC34-IW0002D-037.5-20110202	2/2/11	1445	1459 -006	GW	3	3		
LC34-IW0002S-007.0-20110202				GW	3	3		
LC34-IW0002D1-052.5-20110202	2/2/11	1400	1423 -007	GW	3	3		
LC34-IW0076-075.0-20110202	2/2/11	1535	1554 -008	GW	3	3		

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: 18 Feb

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Christine M. Kutzar
 Firm: CAS
 Date/Time: 2/3/11 0933

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Josiah Barrett
 Firm: Geosyntec
 Date/Time: 2/4/11 1640

R1100644
 Geosyntec Consultants
 ESTCP PED LC34 2/2/11



R1100644

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Comments/Special Instructions:

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	Analysis Requested	REMARKS
LC34-IW0070D-040.5-20110202	2/2/11	1059	-009	GW	3	3		
LC34-IW0070D-040.5-20110202				GW	3	3		
LC34-IW0070D-040.5-20110202	2/2/11	1307	-010	GW	3	3		
LC34-IW0070D1-070.0-20110202		1313	-011	GW	3	3		
LC34-IW0071D-040.5-20110202		1100	-012	GW	3	3		
LC34-IW0071D1-070.0-20110202	2/2/11	1125	-013	GW	3	3		

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: 18 Feb

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

Comments/Special Instructions:
R11000644

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARRETT
 Firm: GEOSYNTEC
 Date/Time: 2/2/11 1640

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Christina M Kutas
 Firm: CAS
 Date/Time: 2/3/11 0933

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R1100644

Cooler received on 2/3/11 by: cmk **COURIER:** CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A see below
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 12°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/3/11 0935

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: DS 2/3/11

Cooler Breakdown: Date: 2/3/11 Time: 1103 by: cmk

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 0-235-002

Other Comments:

1W0071D 2/2/11 1100 (1) vial w/air bubble
RW0007 2/2/11 1555 (1) vial w/air bubble } 2 vials ok for each

PC Secondary Review: DS

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

February 23, 2011

Service Request No: R1100666

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 2/3/11/ TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on February 4, 2011. For your reference, these analyses have been assigned our service request number **R1100666**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272 2/3/11
Sample Matrix: Water

Service Request No.: R1100666
Date Received: 2/4/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Six (6) water samples were collected by the client on 2/3/11 and were received for analysis at Columbia Analytical Services on 2/4/11 via a national courier. The samples were received at a cooler temperature of 1°C, within the 0-6°C guidelines.

Volatile Organic Compounds by EPA Method 8260C

Water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except the following: The minimum response factor for Carbon Tetrachloride was not met in the ICV from 1/7/11. The data has been considered acceptable since the MRL has been verified by the low standard in the calibration.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several compounds had hits above the calibration range of the standards. The hits are flagged as "E", estimated. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". Both sets of data are included in the report. Only the "E", estimated values should be used from the diluted reanalysis.

The 1,1,2-Trichloro-1,2,2-trifluoroethane and cis-1,2-Dichloroethene hits for location LC34-1W0067D1-068.0-20110203 (R1100666-006) are carryover from the hits in the previous location (-005).

Samples were analyzed within 7 days from collection, the holding time for unpreserved vials.

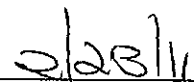
The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date



00002

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1100666

<u>Lab ID</u>	<u>Client ID</u>
R1100666-001	LC34-IJ0019-037.0-20110203
R1100666-002	LC34-IJ0020-052.0-20110203
R1100666-003	LC34-IJ0015-037.0-20110203
R1100666-004	LC34-IJ0016-052.0-20110203
R1100666-005	LC34-IW0002I-027.5-20110203
R1100666-006	LC34-IW0067D1-068.0-20110203

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
Connecticut ID # PH0556	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158
Nebraska Accredited	West Virginia ID # 292
Navy Facilities Engineering Service Center Approved	

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 1149
 Date Received: 2/ 4/11
 Date Analyzed: 2/9/11 20:58

Sample Name: LC34-IJ0019-037.0-20110203
 Lab Code: R1100666-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\MSVOA12\DATA\020911\U5530.D\

Analysis Lot: 235572
 Instrument Name: R-MS-12
 Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	15	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	15	
79-00-5	1,1,2-Trichloroethane	250	U	250	15	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	140	J	250	20	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	15	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	19	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	15	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	
106-93-4	1,2-Dibromoethane	250	U	250	15	
95-50-1	1,2-Dichlorobenzene	250	U	250	20	
107-06-2	1,2-Dichloroethane	250	U	250	15	
78-87-5	1,2-Dichloropropane	250	U	250	33	
541-73-1	1,3-Dichlorobenzene	250	U	250	18	
106-46-7	1,4-Dichlorobenzene	250	U	250	17	
71-36-3	n-Butanol	2500	U	2500	340	
78-93-3	2-Butanone (MEK)	500	U	500	50	
591-78-6	2-Hexanone	500	U	500	20	
108-10-1	4-Methyl-2-pentanone	500	U	500	17	
67-64-1	Acetone	1000	U	1000	80	
71-43-2	Benzene	250	U	250	16	
75-27-4	Bromodichloromethane	250	U	250	21	
75-25-2	Bromoform	250	U	250	15	
74-83-9	Bromomethane	250	U	250	20	
75-15-0	Carbon Disulfide	500	U	500	18	
56-23-5	Carbon Tetrachloride	250	U	250	18	
108-90-7	Chlorobenzene	250	U	250	15	
75-00-3	Chloroethane	250	U	250	15	
67-66-3	Chloroform	250	U	250	15	
74-87-3	Chloromethane	250	U	250	23	
110-82-7	Cyclohexane	500	U	500	15	
124-48-1	Dibromochloromethane	250	U	250	15	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	37	
75-09-2	Dichloromethane	250	U	250	15	
100-41-4	Ethylbenzene	250	U	250	21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: 2/ 3/11 1149
Date Received: 2/ 4/11
Date Analyzed: 2/9/11 20:58

Sample Name: LC34-IJ0019-037.0-20110203
Lab Code: R1100666-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA12\DATA\020911\U5530.D\

Analysis Lot: 235572
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250 U	250	17	
79-20-9	Methyl Acetate	500 U	500	33	
1634-04-4	Methyl tert-Butyl Ether	250 U	250	15	
108-87-2	Methylcyclohexane	500 U	500	15	
100-42-5	Styrene	250 U	250	18	
127-18-4	Tetrachloroethene (PCE)	250 U	250	21	
108-88-3	Toluene	250 U	250	15	
79-01-6	Trichloroethene (TCE)	250 U	250	15	
75-69-4	Trichlorofluoromethane (CFC 11)	250 U	250	15	
75-01-4	Vinyl Chloride	5500	250	15	
156-59-2	cis-1,2-Dichloroethene	6400	250	15	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	15	
179601-23-1	m,p-Xylenes	250 U	250	41	
123-86-4	n-Butyl Acetate	250 U	250	15	
95-47-6	o-Xylene	250 U	250	20	
156-60-5	trans-1,2-Dichloroethene	180 J	250	15	
10061-02-6	trans-1,3-Dichloropropene	250 U	250	15	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/9/11 20:58	
Dibromofluoromethane	108	89-119	2/9/11 20:58	
Toluene-d8	109	87-121	2/9/11 20:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 1357
 Date Received: 2/ 4/11
 Date Analyzed: 2/8/11 13:50

Sample Name: LC34-IJ0020-052.0-20110203
 Lab Code: R1100666-002

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5500.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	3.0	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	3.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	3.0	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	23 J	50	4.0	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	3.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50 U	50	3.7	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	3.0	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	4.3	
106-93-4	1,2-Dibromoethane	50 U	50	3.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	4.0	
107-06-2	1,2-Dichloroethane	50 U	50	3.0	
78-87-5	1,2-Dichloropropane	50 U	50	6.7	
541-73-1	1,3-Dichlorobenzene	50 U	50	3.6	
106-46-7	1,4-Dichlorobenzene	50 U	50	3.5	
71-36-3	n-Butanol	500 U	500	67	
78-93-3	2-Butanone (MEK)	100 U	100	10	
591-78-6	2-Hexanone	100 U	100	4.0	
108-10-1	4-Methyl-2-pentanone	100 U	100	3.5	
67-64-1	Acetone	200 U	200	16	
71-43-2	Benzene	50 U	50	3.1	
75-27-4	Bromodichloromethane	50 U	50	4.1	
75-25-2	Bromoform	50 U	50	3.0	
74-83-9	Bromomethane	50 U	50	4.0	
75-15-0	Carbon Disulfide	100 U	100	3.5	
56-23-5	Carbon Tetrachloride	50 U	50	3.6	
108-90-7	Chlorobenzene	50 U	50	3.0	
75-00-3	Chloroethane	50 U	50	3.0	
67-66-3	Chloroform	50 U	50	3.0	
74-87-3	Chloromethane	50 U	50	4.7	
110-82-7	Cyclohexane	100 U	100	3.0	
124-48-1	Dibromochloromethane	50 U	50	3.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	7.3	
75-09-2	Dichloromethane	50 U	50	3.0	
100-41-4	Ethylbenzene	50 U	50	4.2	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 1357
 Date Received: 2/ 4/11
 Date Analyzed: 2/8/11 13:50

Sample Name: LC34-IJ0020-052.0-20110203
 Lab Code: R1100666-002

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5500.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50 U	50	3.5	
79-20-9	Methyl Acetate	100 U	100	6.7	
1634-04-4	Methyl tert-Butyl Ether	50 U	50	3.0	
108-87-2	Methylcyclohexane	100 U	100	3.0	
100-42-5	Styrene	50 U	50	3.5	
127-18-4	Tetrachloroethene (PCE)	50 U	50	4.2	
108-88-3	Toluene	50 U	50	3.0	
79-01-6	Trichloroethene (TCE)	50 U	50	3.0	
75-69-4	Trichlorofluoromethane (CFC 11)	50 U	50	3.0	
75-01-4	Vinyl Chloride	410	50	3.0	
156-59-2	cis-1,2-Dichloroethene	1400	50	3.0	
10061-01-5	cis-1,3-Dichloropropene	50 U	50	3.0	
179601-23-1	m,p-Xylenes	50 U	50	8.2	
123-86-4	n-Butyl Acetate	50 U	50	3.0	
95-47-6	o-Xylene	50 U	50	4.0	
156-60-5	trans-1,2-Dichloroethene	30 J	50	3.0	
10061-02-6	trans-1,3-Dichloropropene	50 U	50	3.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/8/11 13:50	
Dibromofluoromethane	106	89-119	2/8/11 13:50	
Toluene-d8	108	87-121	2/8/11 13:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/3/11 0954
 Date Received: 2/4/11
 Date Analyzed: 2/8/11 14:22

Sample Name: LC34-IJ0015-037.0-20110203
 Lab Code: R1100666-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5501.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 0954
 Date Received: 2/ 4/11
 Date Analyzed: 2/8/11 14:22

Sample Name: LC34-IJ0015-037.0-20110203
 Lab Code: R1100666-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5501.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	
79-20-9	Methyl Acetate	5000	U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	150	
108-87-2	Methylcyclohexane	5000	U	5000	150	
100-42-5	Styrene	2500	U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	210	
108-88-3	Toluene	2500	U	2500	150	
79-01-6	Trichloroethene (TCE)	3400		2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	150	
75-01-4	Vinyl Chloride	3300		2500	150	
156-59-2	cis-1,2-Dichloroethene	70000		2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	150	
179601-23-1	m,p-Xylenes	2500	U	2500	410	
123-86-4	n-Butyl Acetate	2500	U	2500	150	
95-47-6	o-Xylene	2500	U	2500	200	
156-60-5	trans-1,2-Dichloroethene	320	J	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/8/11 14:22	
Dibromofluoromethane	110	89-119	2/8/11 14:22	
Toluene-d8	109	87-121	2/8/11 14:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: 2/ 3/11 1042
Date Received: 2/ 4/11
Date Analyzed: 2/8/11 14:53

Sample Name: LC34-IJ0016-052.0-20110203
Lab Code: R1100666-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA12\DATA\020811\U5502.D\

Analysis Lot: 235312
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	60	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	60	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	60	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	U	1000	80	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	60	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	
106-93-4	1,2-Dibromoethane	1000	U	1000	60	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	80	
107-06-2	1,2-Dichloroethane	1000	U	1000	60	
78-87-5	1,2-Dichloropropane	1000	U	1000	140	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	72	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	68	
71-36-3	n-Butanol	10000	U	10000	1400	
78-93-3	2-Butanone (MEK)	2000	U	2000	200	
591-78-6	2-Hexanone	2000	U	2000	80	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	68	
67-64-1	Acetone	4000	U	4000	320	
71-43-2	Benzene	1000	U	1000	62	
75-27-4	Bromodichloromethane	1000	U	1000	82	
75-25-2	Bromoform	1000	U	1000	60	
74-83-9	Bromomethane	1000	U	1000	80	
75-15-0	Carbon Disulfide	2000	U	2000	70	
56-23-5	Carbon Tetrachloride	1000	U	1000	72	
108-90-7	Chlorobenzene	1000	U	1000	60	
75-00-3	Chloroethane	1000	U	1000	60	
67-66-3	Chloroform	1000	U	1000	60	
74-87-3	Chloromethane	1000	U	1000	92	
110-82-7	Cyclohexane	2000	U	2000	60	
124-48-1	Dibromochloromethane	1000	U	1000	60	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	
75-09-2	Dichloromethane	1000	U	1000	60	
100-41-4	Ethylbenzene	1000	U	1000	84	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: 2/ 3/11 1042
Date Received: 2/ 4/11
Date Analyzed: 2/8/11 14:53

Sample Name: LC34-IJ0016-052.0-20110203
Lab Code: R1100666-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA12\DATA\020811\U5502.D\

Analysis Lot: 235312
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	68	
79-20-9	Methyl Acetate	2000	U	2000	140	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	60	
108-87-2	Methylcyclohexane	2000	U	2000	60	
100-42-5	Styrene	1000	U	1000	70	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	84	
108-88-3	Toluene	1000	U	1000	60	
79-01-6	Trichloroethene (TCE)	600	J	1000	60	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	60	
75-01-4	Vinyl Chloride	400	J	1000	60	
156-59-2	cis-1,2-Dichloroethene	37000		1000	60	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	60	
179601-23-1	m,p-Xylenes	1000	U	1000	170	
123-86-4	n-Butyl Acetate	1000	U	1000	60	
95-47-6	o-Xylene	1000	U	1000	80	
156-60-5	trans-1,2-Dichloroethene	180	J	1000	60	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	60	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/8/11 14:53	
Dibromofluoromethane	109	89-119	2/8/11 14:53	
Toluene-d8	108	87-121	2/8/11 14:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/3/11 0846
 Date Received: 2/4/11
 Date Analyzed: 2/8/11 15:25

Sample Name: LC34-IW0002I-027.5-20110203
 Lab Code: R1100666-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5503.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	30	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	30	
79-00-5	1,1,2-Trichloroethane	500	U	500	30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	53000	E	500	40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500	U	500	37	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	
106-93-4	1,2-Dibromoethane	500	U	500	30	
95-50-1	1,2-Dichlorobenzene	500	U	500	40	
107-06-2	1,2-Dichloroethane	500	U	500	30	
78-87-5	1,2-Dichloropropane	500	U	500	66	
541-73-1	1,3-Dichlorobenzene	500	U	500	36	
106-46-7	1,4-Dichlorobenzene	500	U	500	34	
71-36-3	n-Butanol	5000	U	5000	670	
78-93-3	2-Butanone (MEK)	1000	U	1000	100	
591-78-6	2-Hexanone	1000	U	1000	40	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	34	
67-64-1	Acetone	2000	U	2000	160	
71-43-2	Benzene	500	U	500	31	
75-27-4	Bromodichloromethane	500	U	500	41	
75-25-2	Bromoform	500	U	500	30	
74-83-9	Bromomethane	500	U	500	40	
75-15-0	Carbon Disulfide	1000	U	1000	35	
56-23-5	Carbon Tetrachloride	500	U	500	36	
108-90-7	Chlorobenzene	500	U	500	30	
75-00-3	Chloroethane	500	U	500	30	
67-66-3	Chloroform	500	U	500	30	
74-87-3	Chloromethane	500	U	500	46	
110-82-7	Cyclohexane	1000	U	1000	30	
124-48-1	Dibromochloromethane	500	U	500	30	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	73	
75-09-2	Dichloromethane	500	U	500	30	
100-41-4	Ethylbenzene	500	U	500	42	
98-82-8	Isopropylbenzene (Cumene)	500	U	500	34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: 2/3/11 0846
Date Received: 2/4/11
Date Analyzed: 2/8/11 15:25

Sample Name: LC34-IW0002I-027.5-20110203
Lab Code: R1100666-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5503.D\

Analysis Lot: 235312
Instrument Name: R-MS-12
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	1000	U	1000	66	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	30	
108-87-2	Methylcyclohexane	1000	U	1000	30	
100-42-5	Styrene	500	U	500	35	
127-18-4	Tetrachloroethene (PCE)	500	U	500	42	
108-88-3	Toluene	500	U	500	30	
79-01-6	Trichloroethene (TCE)	370	J	500	30	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	30	
75-01-4	Vinyl Chloride	630		500	30	
156-59-2	cis-1,2-Dichloroethene	30000	E	500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	30	
179601-23-1	m,p-Xylenes	500	U	500	81	
123-86-4	n-Butyl Acetate	500	U	500	30	
95-47-6	o-Xylene	500	U	500	40	
156-60-5	trans-1,2-Dichloroethene	510		500	30	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	2/8/11 15:25	
Dibromofluoromethane	106	89-119	2/8/11 15:25	
Toluene-d8	108	87-121	2/8/11 15:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/3/11 0846
 Date Received: 2/4/11
 Date Analyzed: 2/9/11 21:29

Sample Name: LC34-IW0002I-027.5-20110203
 Lab Code: R1100666-005
 Run Type: Dilution

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020911\U5531.D\

Analysis Lot: 235572
 Instrument Name: R-MS-12
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	150	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	150	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	150	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	47000	D	2500	200	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	150	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	
106-93-4	1,2-Dibromoethane	2500	U	2500	150	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	200	
107-06-2	1,2-Dichloroethane	2500	U	2500	150	
78-87-5	1,2-Dichloropropane	2500	U	2500	330	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	180	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	170	
71-36-3	n-Butanol	25000	U	25000	3400	
78-93-3	2-Butanone (MEK)	5000	U	5000	500	
591-78-6	2-Hexanone	5000	U	5000	200	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	170	
67-64-1	Acetone	10000	U	10000	800	
71-43-2	Benzene	2500	U	2500	160	
75-27-4	Bromodichloromethane	2500	U	2500	210	
75-25-2	Bromoform	2500	U	2500	150	
74-83-9	Bromomethane	2500	U	2500	200	
75-15-0	Carbon Disulfide	5000	U	5000	180	
56-23-5	Carbon Tetrachloride	2500	U	2500	180	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	150	
67-66-3	Chloroform	2500	U	2500	150	
74-87-3	Chloromethane	2500	U	2500	230	
110-82-7	Cyclohexane	5000	U	5000	150	
124-48-1	Dibromochloromethane	2500	U	2500	150	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	
75-09-2	Dichloromethane	2500	U	2500	150	
100-41-4	Ethylbenzene	2500	U	2500	210	
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	170	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: 2/ 3/11 0846
Date Received: 2/ 4/11
Date Analyzed: 2/9/11 21:29

Sample Name: LC34-IW0002I-027.5-20110203
Lab Code: R1100666-005
Run Type: Dilution

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\020911\U5531.D\

Analysis Lot: 235572
Instrument Name: R-MS-12
Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	5000 U	5000	330	
1634-04-4	Methyl tert-Butyl Ether	2500 U	2500	150	
108-87-2	Methylcyclohexane	5000 U	5000	150	
100-42-5	Styrene	2500 U	2500	180	
127-18-4	Tetrachloroethene (PCE)	2500 U	2500	210	
108-88-3	Toluene	2500 U	2500	150	
79-01-6	Trichloroethene (TCE)	350 DJ	2500	150	
75-69-4	Trichlorofluoromethane (CFC 11)	2500 U	2500	150	
75-01-4	Vinyl Chloride	530 DJ	2500	150	
156-59-2	cis-1,2-Dichloroethene	27000 D	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500 U	2500	150	
179601-23-1	m,p-Xylenes	2500 U	2500	410	
123-86-4	n-Butyl Acetate	2500 U	2500	150	
95-47-6	o-Xylene	2500 U	2500	200	
156-60-5	trans-1,2-Dichloroethene	420 DJ	2500	150	
10061-02-6	trans-1,3-Dichloropropene	2500 U	2500	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/9/11 21:29	
Dibromofluoromethane	109	89-119	2/9/11 21:29	
Toluene-d8	109	87-121	2/9/11 21:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 1449
 Date Received: 2/ 4/11
 Date Analyzed: 2/8/11 15:56

Sample Name: LC34-IW0067D1-068.0-20110203
 Lab Code: R1100666-006

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5504.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.46 J	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: 2/ 3/11 1449
 Date Received: 2/ 4/11
 Date Analyzed: 2/8/11 15:56

Sample Name: LC34-IW0067D1-068.0-20110203
 Lab Code: R1100666-006

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020811\U5504.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	0.88 J	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/8/11 15:56	
Dibromofluoromethane	108	89-119	2/8/11 15:56	
Toluene-d8	109	87-121	2/8/11 15:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/8/11 11:27

Sample Name: Method Blank
 Lab Code: RQ1101297-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\MSVOA12\DATA\020811\U5496.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/8/11 11:27

Sample Name: Method Blank
 Lab Code: RQ1101297-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\MSVOA12\DATA\020811\U5496.D\

Analysis Lot: 235312
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	
79-20-9	Methyl Acetate	10 U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.30	
108-87-2	Methylcyclohexane	10 U	10	0.30	
100-42-5	Styrene	5.0 U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.42	
108-88-3	Toluene	5.0 U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.30	
95-47-6	o-Xylene	5.0 U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/8/11 11:27	
Dibromofluoromethane	108	89-119	2/8/11 11:27	
Toluene-d8	109	87-121	2/8/11 11:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/9/11 13:10

Sample Name: Method Blank
 Lab Code: RQ1101318-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA12\DATA\020911\U5515.D\

Analysis Lot: 235572
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.30	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.30	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.40	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.66	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.36	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.34	
71-36-3	n-Butanol	50 U	50	6.7	
78-93-3	2-Butanone (MEK)	10 U	10	1.0	
591-78-6	2-Hexanone	10 U	10	0.40	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.34	
67-64-1	Acetone	20 U	20	1.6	
71-43-2	Benzene	5.0 U	5.0	0.31	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.41	
75-25-2	Bromoform	5.0 U	5.0	0.30	
74-83-9	Bromomethane	5.0 U	5.0	0.40	
75-15-0	Carbon Disulfide	10 U	10	0.35	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.36	
108-90-7	Chlorobenzene	5.0 U	5.0	0.30	
75-00-3	Chloroethane	5.0 U	5.0	0.30	
67-66-3	Chloroform	5.0 U	5.0	0.30	
74-87-3	Chloromethane	5.0 U	5.0	0.46	
110-82-7	Cyclohexane	10 U	10	0.30	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	
75-09-2	Dichloromethane	5.0 U	5.0	0.30	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Collected: NA
Date Received: NA
Date Analyzed: 2/9/11 13:10

Sample Name: Method Blank
Lab Code: RQ1101318-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\020911\U5515.D\

Analysis Lot: 235572
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	
79-20-9	Methyl Acetate	10	U	10	0.66	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.30	
108-87-2	Methylcyclohexane	10	U	10	0.30	
100-42-5	Styrene	5.0	U	5.0	0.35	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.42	
108-88-3	Toluene	5.0	U	5.0	0.30	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.30	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.30	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.30	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.81	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.30	
95-47-6	o-Xylene	5.0	U	5.0	0.40	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.30	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/9/11 13:10	
Dibromofluoromethane	108	89-119	2/9/11 13:10	
Toluene-d8	109	87-121	2/9/11 13:10	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/3/11/ TR0272
Sample Matrix: Water

Service Request: R1100666
Date Analyzed: 2/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235312

**Lab Control Sample
 RQ1101297-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.3	20.0	87	72 - 128
1,1,2,2-Tetrachloroethane	18.8	20.0	94	72 - 131
1,1,2-Trichloroethane	18.9	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.8	20.0	89	71 - 134
1,1-Dichloroethane (1,1-DCA)	16.9	20.0	85	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.8	20.0	84	72 - 129
1,2,4-Trichlorobenzene	20.0	20.0	100	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	19.2	20.0	96	78 - 125
1,2-Dichlorobenzene	19.1	20.0	95	79 - 124
1,2-Dichloroethane	20.8	20.0	104	78 - 126
1,2-Dichloropropane	17.9	20.0	90	80 - 123
1,3-Dichlorobenzene	19.0	20.0	95	78 - 124
1,4-Dichlorobenzene	18.5	20.0	92	78 - 123
n-Butanol	1010	1000	101	70 - 130
2-Butanone (MEK)	18.4	20.0	92	60 - 133
2-Hexanone	18.3	20.0	92	61 - 131
4-Methyl-2-pentanone	19.1	20.0	95	61 - 132
Acetone	18.2	20.0	91	59 - 140
Benzene	17.6	20.0	88	78 - 121
Bromodichloromethane	19.2	20.0	96	80 - 125
Bromoform	20.8	20.0	104	73 - 132
Bromomethane	15.9	20.0	80	57 - 144
Carbon Disulfide	18.5	20.0	92	59 - 138
Carbon Tetrachloride	18.4	20.0	92	69 - 135
Chlorobenzene	18.6	20.0	93	80 - 121
Chloroethane	18.1	20.0	91	71 - 130
Chloroform	18.4	20.0	92	78 - 125
Chloromethane	18.6	20.0	93	62 - 133
Cyclohexane	20.2	20.0	101	67 - 127
Dibromochloromethane	20.1	20.0	100	78 - 133
Dichlorodifluoromethane (CFC 12)	21.6	20.0	108	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Analyzed: 2/ 8/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235312

Lab Control Sample
 RQ1101297-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.5	20.0	82	75 - 125
Ethylbenzene	17.9	20.0	90	78 - 123
Isopropylbenzene (Cumene)	20.6	20.0	103	73 - 133
Methyl Acetate	15.8	20.0	79	57 - 157
Methyl tert-Butyl Ether	17.9	20.0	89	75 - 126
Methylcyclohexane	19.7	20.0	98	64 - 133
Styrene	18.5	20.0	92	80 - 132
Tetrachloroethene (PCE)	19.2	20.0	96	72 - 131
Toluene	18.8	20.0	94	78 - 122
Trichloroethene (TCE)	17.8	20.0	89	74 - 127
Trichlorofluoromethane (CFC 11)	19.9	20.0	100	71 - 139
Vinyl Chloride	20.2	20.0	101	71 - 136
cis-1,2-Dichloroethene	17.0	20.0	85	78 - 122
cis-1,3-Dichloropropene	17.2	20.0	86	77 - 125
m,p-Xylenes	36.3	40.0	91	79 - 126
n-Butyl Acetate	18.4	20.0	92	54 - 127
o-Xylene	17.8	20.0	89	79 - 126
trans-1,2-Dichloroethene	16.1	20.0	81	75 - 121
trans-1,3-Dichloropropene	18.2	20.0	91	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Analyzed: 2/9/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235572

Lab Control Sample
 RQ1101318-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.7	20.0	88	72 - 128
1,1,2,2-Tetrachloroethane	17.2	20.0	86	72 - 131
1,1,2-Trichloroethane	17.9	20.0	89	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.1	20.0	95	71 - 134
1,1-Dichloroethane (1,1-DCA)	17.2	20.0	86	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.5	20.0	83	72 - 129
1,2,4-Trichlorobenzene	19.7	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.4	20.0	82	62 - 131
1,2-Dibromoethane	18.0	20.0	90	78 - 125
1,2-Dichlorobenzene	18.1	20.0	91	79 - 124
1,2-Dichloroethane	19.9	20.0	99	78 - 126
1,2-Dichloropropane	17.3	20.0	86	80 - 123
1,3-Dichlorobenzene	18.3	20.0	91	78 - 124
1,4-Dichlorobenzene	18.4	20.0	92	78 - 123
n-Butanol	1160	1000	116	70 - 130
2-Butanone (MEK)	18.0	20.0	90	60 - 133
2-Hexanone	19.7	20.0	98	61 - 131
4-Methyl-2-pentanone	20.3	20.0	102	61 - 132
Acetone	19.1	20.0	95	59 - 140
Benzene	17.5	20.0	87	78 - 121
Bromodichloromethane	18.3	20.0	92	80 - 125
Bromoform	19.9	20.0	99	73 - 132
Bromomethane	16.5	20.0	82	57 - 144
Carbon Disulfide	21.2	20.0	106	59 - 138
Carbon Tetrachloride	18.9	20.0	95	69 - 135
Chlorobenzene	18.0	20.0	90	80 - 121
Chloroethane	17.5	20.0	88	71 - 130
Chloroform	17.8	20.0	89	78 - 125
Chloromethane	18.5	20.0	92	62 - 133
Cyclohexane	19.0	20.0	95	67 - 127
Dibromochloromethane	18.8	20.0	94	78 - 133
Dichlorodifluoromethane (CFC 12)	21.9	20.0	109	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/3/11/ TR0272
 Sample Matrix: Water

Service Request: R1100666
 Date Analyzed: 2/ 9/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 235572

Lab Control Sample

RQ1101318-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.2	20.0	81	75 - 125
Ethylbenzene	17.7	20.0	89	78 - 123
Isopropylbenzene (Cumene)	20.4	20.0	102	73 - 133
Methyl Acetate	16.0	20.0	80	57 - 157
Methyl tert-Butyl Ether	17.4	20.0	87	75 - 126
Methylcyclohexane	17.7	20.0	88	64 - 133
Styrene	17.9	20.0	90	80 - 132
Tetrachloroethene (PCE)	19.9	20.0	99	72 - 131
Toluene	18.6	20.0	93	78 - 122
Trichloroethene (TCE)	18.3	20.0	92	74 - 127
Trichlorofluoromethane (CFC 11)	20.6	20.0	103	71 - 139
Vinyl Chloride	20.4	20.0	102	71 - 136
cis-1,2-Dichloroethene	16.9	20.0	85	78 - 122
cis-1,3-Dichloropropene	16.4	20.0	82	77 - 125
m,p-Xylenes	36.5	40.0	91	79 - 126
n-Butyl Acetate	17.4	20.0	87	54 - 127
o-Xylene	17.8	20.0	89	79 - 126
trans-1,2-Dichloroethene	16.0	20.0	80	75 - 121
trans-1,3-Dichloropropene	17.5	20.0	87	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	Analysis Requested	REMARKS
LC34-JU0019-037.0-20110203	2/3/11	1149	-001	GW	3	VOCs (8260C) plus n-butyl acetate	
LC34-JU020-052.0-20110203		1357	-002	GW	3		
LC34-JU015-037.0-20110203		0954	-003	GW	3		
LC34-JU016-052.0-20110203	2/3/11	1042	-004	GW	3		
LC34-IW0021-0245-20110203	2/3/11	0846	-005	GW	3		
LC34-IW00701-060.0-20110203	2/3/11	1449	-006	GW	3		

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: 18 Feb

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Jessie Barrett
 Firm: Geosyntec
 Date/Time: 2/9/11 1553

RECEIVED BY:
 Signature: [Signature]
 Printed Name: B Doyle
 Firm: CAS
 Date/Time: 2/4/11 0928

R1100666
 Geosyntec Consultants
 ESTCP PED LC34 2/8/11



Comments/Special Instructions:

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R11000000

Cooler received on 2/4/11 by: BD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 1°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/4 @ 0934

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 2/4/11

Cooler Breakdown: Date: 2/4/11 Time: 1108 by: cnk

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	Lot Received		Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO					
≥12	NaOH							
≤2	HNO ₃							
≤2	H ₂ SO ₄							
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid				
	Na ₂ S ₂ O ₃	-	-		*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-					
	HCl	*	*					

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 0-235-002
 Other Comments: _____

PC Secondary Review: KB 2/22/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

January 31, 2011

Service Request No: R1100446

Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP LC34 TR0272

Dear Cory:

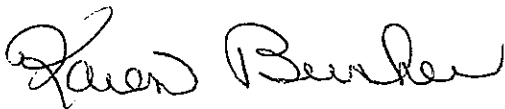
Enclosed are the results of the sample(s) submitted to our laboratory on January 25, 2011. For your reference, these analyses have been assigned our service request number **R1100446**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1100446

Lab ID
R1100446-001

Client ID
LC34-WS0001-0000-20110124

All samples were received in good condition unless otherwise noted on the cooler receipt and preservation check form located at the end of this report.

All samples were preserved in accordance with approved analytical methods.

All samples have been analyzed by the approved methods cited on the analytical results pages.

All holding times and associated QC were within limits.

No analytical or QC problems were encountered.

All sampling activities performed by CAS personnel have been in accordance with "CAS Field Procedures and Measurements Manual" or by client specifications.

00002



REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
Connecticut ID # PH0556	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158
Nebraska Accredited	West Virginia ID # 292
Navy Facilities Engineering Service Center Approved	

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil
Sample Name: LC34-WS0001-0000-20110124
Lab Code: R1100446-001

Service Request: R1100446
Date Collected: 1/24/11 0845
Date Received: 1/25/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	88.1	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil
Sample Name: LC34-WS0001-0000-20110124
Lab Code: R1100446-001

Service Request: R1100446
Date Collected: 1/24/11 0845
Date Received: 1/25/11

Basis: Dry
Percent Solids: 88.1

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Total	6010C	1.6	mg/Kg	1.1	1	1/25/11	1/27/11 12:33	
Barium, Total	6010C	7.3	mg/Kg	2.2	1	1/25/11	1/27/11 12:33	
Cadmium, Total	6010C	0.56 U	mg/Kg	0.56	1	1/25/11	1/27/11 12:33	
Chromium, Total	6010C	7.1	mg/Kg	1.1	1	1/25/11	1/27/11 12:33	
Lead, Total	6010C	5.9	mg/Kg	5.6	1	1/25/11	1/27/11 12:33	
Mercury, Total	7471B	0.056 U	mg/Kg	0.056	1	1/26/11	1/26/11 14:15	
Selenium, Total	6010C	1.1 U	mg/Kg	1.1	1	1/25/11	1/27/11 12:33	
Silver, Total	6010C	1.1 U	mg/Kg	1.1	1	1/25/11	1/27/11 12:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: 1/24/11 0845
Date Received: 1/25/11
Date Analyzed: 1/25/11 16:39

Sample Name: LC34-WS0001-0000-20110124
Lab Code: R1100446-001

Units: µg/Kg
Basis: Dry
Percent Solids: 88.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: H9556.D

Analysis Lot: 233307
Instrument Name: R-MS-07
Dilution Factor: 1.25

CAS No.	Analyte Name	Result	Q	MRL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	7.1	U	7.1	
79-34-5	1,1,2,2-Tetrachloroethane	7.1	U	7.1	
79-00-5	1,1,2-Trichloroethane	7.1	U	7.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	7.1	U	7.1	
75-35-4	1,1-Dichloroethene (1,1-DCE)	7.1	U	7.1	
107-06-2	1,2-Dichloroethane	7.1	U	7.1	
78-87-5	1,2-Dichloropropane	7.1	U	7.1	
78-93-3	2-Butanone (MEK)	14	U	14	
591-78-6	2-Hexanone	14	U	14	
108-10-1	4-Methyl-2-pentanone	14	U	14	
67-64-1	Acetone	28	U	28	
71-43-2	Benzene	7.1	U	7.1	
75-27-4	Bromodichloromethane	7.1	U	7.1	
75-25-2	Bromoform	7.1	U	7.1	
74-83-9	Bromomethane	7.1	U	7.1	
75-15-0	Carbon Disulfide	14	U	14	
56-23-5	Carbon Tetrachloride	7.1	U	7.1	
108-90-7	Chlorobenzene	7.1	U	7.1	
75-00-3	Chloroethane	7.1	U	7.1	
67-66-3	Chloroform	7.1	U	7.1	
74-87-3	Chloromethane	7.1	U	7.1	
124-48-1	Dibromochloromethane	7.1	U	7.1	
75-09-2	Dichloromethane	7.1	U	7.1	
100-41-4	Ethylbenzene	7.1	U	7.1	
100-42-5	Styrene	7.1	U	7.1	
127-18-4	Tetrachloroethene (PCE)	7.1	U	7.1	
108-88-3	Toluene	7.1	U	7.1	
79-01-6	Trichloroethene (TCE)	7.1	U	7.1	
75-01-4	Vinyl Chloride	22		7.1	
156-59-2	cis-1,2-Dichloroethene	190		7.1	
10061-01-5	cis-1,3-Dichloropropene	7.1	U	7.1	
179601-23-1	m,p-Xylenes	7.1	U	7.1	
95-47-6	o-Xylene	7.1	U	7.1	
156-60-5	trans-1,2-Dichloroethene	7.1	U	7.1	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: 1/24/11 0845
Date Received: 1/25/11
Date Analyzed: 1/25/11 16:39

Sample Name: LC34-WS0001-0000-20110124
Lab Code: R1100446-001

Units: µg/Kg
Basis: Dry
Percent Solids: 88.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: H9556.D

Analysis Lot: 233307
Instrument Name: R-MS-07
Dilution Factor: 1.25

CAS No.	Analyte Name	Result	Q	MRL	Note
10061-02-6	trans-1,3-Dichloropropene	7.1	U	7.1	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	59-132	1/25/11 16:39	
Dibromofluoromethane	94	65-136	1/25/11 16:39	
Toluene-d8	105	75-126	1/25/11 16:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: 1/24/11 0845
Date Received: 1/25/11
Pre-Prep Date: 1/25/11
Date Analyzed: 1/26/11 20:52

Sample Name: LC34-WS0001-0000-20110124
Lab Code: R1100446-001

Units: µg/L
Basis: As Received

**Toxicity Characteristics Leachate Procedure (TCLP)
 TCLP Volatile Organics by GC/MS**

Analytical Method: 8260C
Pre-Prep Method: EPA 1311
Data File Name: D0235.D

Analysis Lot: 233944

Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	
107-06-2	1,2-Dichloroethane	50	U	50	
78-93-3	2-Butanone (MEK)	100	U	100	
71-43-2	Benzene	50	U	50	
56-23-5	Carbon Tetrachloride	50	U	50	
108-90-7	Chlorobenzene	50	U	50	
67-66-3	Chloroform	50	U	50	
127-18-4	Tetrachloroethene (PCE)	50	U	50	
79-01-6	Trichloroethene (TCE)	50	U	50	
75-01-4	Vinyl Chloride	50	U	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	1/26/11 20:52	
Dibromofluoromethane	109	89-119	1/26/11 20:52	
Toluene-d8	111	87-121	1/26/11 20:52	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100446-MB1

Service Request: R1100446
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100446-MB2

Service Request: R1100446
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	1/26/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1100446-MB

Service Request: R1100446
Date Collected: NA
Date Received: NA

Basis: Dry

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Total	6010C	1.0 U	mg/Kg	1.0	1	1/25/11	1/27/11 10:08	
Barium, Total	6010C	2.0 U	mg/Kg	2.0	1	1/25/11	1/27/11 10:08	
Cadmium, Total	6010C	0.50 U	mg/Kg	0.50	1	1/25/11	1/27/11 10:08	
Chromium, Total	6010C	1.0 U	mg/Kg	1.0	1	1/25/11	1/27/11 10:08	
Lead, Total	6010C	5.0 U	mg/Kg	5.0	1	1/25/11	1/27/11 10:08	
Mercury, Total	7471B	0.050 U	mg/Kg	0.050	1	1/26/11	1/26/11 13:45	
Selenium, Total	6010C	1.0 U	mg/Kg	1.0	1	1/25/11	1/27/11 10:08	
Silver, Total	6010C	1.0 U	mg/Kg	1.0	1	1/25/11	1/27/11 10:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP LC34 TR0272
 Sample Matrix: Soil

Service Request: R1100446
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 1/25/11 13:52

Sample Name: Method Blank
 Lab Code: RQ1100582-04

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
 Data File Name: H9552.D

Analysis Lot: 233307
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	
78-93-3	2-Butanone (MEK)	10	U	10	
591-78-6	2-Hexanone	10	U	10	
108-10-1	4-Methyl-2-pentanone	10	U	10	
67-64-1	Acetone	20	U	20	
71-43-2	Benzene	5.0	U	5.0	
75-27-4	Bromodichloromethane	5.0	U	5.0	
75-25-2	Bromoform	5.0	U	5.0	
74-83-9	Bromomethane	5.0	U	5.0	
75-15-0	Carbon Disulfide	10	U	10	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	
108-90-7	Chlorobenzene	5.0	U	5.0	
75-00-3	Chloroethane	5.0	U	5.0	
67-66-3	Chloroform	5.0	U	5.0	
74-87-3	Chloromethane	5.0	U	5.0	
124-48-1	Dibromochloromethane	5.0	U	5.0	
75-09-2	Dichloromethane	5.0	U	5.0	
100-41-4	Ethylbenzene	5.0	U	5.0	
100-42-5	Styrene	5.0	U	5.0	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	
108-88-3	Toluene	5.0	U	5.0	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	
75-01-4	Vinyl Chloride	5.0	U	5.0	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	
179601-23-1	m,p-Xylenes	5.0	U	5.0	
95-47-6	o-Xylene	5.0	U	5.0	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: NA
Date Received: NA
Date Analyzed: 1/25/11 13:52

Sample Name: Method Blank
Lab Code: RQ1100582-04

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: H9552.D

Analysis Lot: 233307
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	59-132	1/25/11 13:52	
Dibromofluoromethane	106	65-136	1/25/11 13:52	
Toluene-d8	109	75-126	1/25/11 13:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: NA
Date Received: NA
Date Analyzed: 1/26/11 12:52

Sample Name: Method Blank
Lab Code: RQ1100814-01

Units: µg/L
Basis: As Received

TCLP Volatile Organics by GC/MS

Analytical Method: 8260C
Data File Name: D0219.D

Analysis Lot: 233944
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	
78-93-3	2-Butanone (MEK)	10	U	10	
71-43-2	Benzene	5.0	U	5.0	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	
108-90-7	Chlorobenzene	5.0	U	5.0	
67-66-3	Chloroform	5.0	U	5.0	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	
75-01-4	Vinyl Chloride	5.0	U	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	1/26/11 12:52	
Dibromofluoromethane	109	89-119	1/26/11 12:52	
Toluene-d8	110	87-121	1/26/11 12:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Collected: NA
Date Received: NA
Pre-Prep Date: 1/25/11
Date Analyzed: 1/26/11 20:22

Sample Name: Method Blank
Lab Code: RQ1100739-01

Units: µg/L
Basis: As Received

**Toxicity Characteristics Leachate Procedure (TCLP)
 TCLP Volatile Organics by GC/MS**

Analytical Method: 8260C
Pre-Prep Method: EPA 1311
Data File Name: D0234.D

Analysis Lot: 233944

Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	
78-93-3	2-Butanone (MEK)	10	U	10	
71-43-2	Benzene	5.0	U	5.0	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	
108-90-7	Chlorobenzene	5.0	U	5.0	
67-66-3	Chloroform	5.0	U	5.0	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	
75-01-4	Vinyl Chloride	5.0	U	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	1/26/11 20:22	
Dibromofluoromethane	109	89-119	1/26/11 20:22	
Toluene-d8	112	87-121	1/26/11 20:22	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Analyzed: 1/26/11 -
 1/27/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: mg/Kg
Basis: Dry

Analyte Name	Method	Lab Control Sample R1100446-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Arsenic, Total	6010C	87.7	88.3	99	78.1 - 122
Barium, Total	6010C	468	432	108	81.3 - 118
Cadmium, Total	6010C	94.4	91.0	104	81.4 - 118
Chromium, Total	6010C	154	144	107	80.6 - 119
Lead, Total	6010C	112	104	108	79.0 - 121
Mercury, Total	7471B	7.63	6.8	112	72 - 128
Selenium, Total	6010C	192	192	100	80.2 - 119
Silver, Total	6010C	79.0	76.4	103	66.2 - 133

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP LC34 TR0272
 Sample Matrix: Soil

Service Request: R1100446
 Date Analyzed: 1/25/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 233307

Lab Control Sample
 RQ1100582-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.6	20.0	93	72 - 127
1,1,2,2-Tetrachloroethane	18.9	20.0	95	72 - 133
1,1,2-Trichloroethane	18.7	20.0	93	75 - 123
1,1-Dichloroethane (1,1-DCA)	18.6	20.0	93	75 - 122
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	93	74 - 129
1,2-Dichloroethane	19.9	20.0	99	76 - 127
1,2-Dichloropropane	18.6	20.0	93	78 - 121
2-Butanone (MEK)	20.3	20.0	101	64 - 137
2-Hexanone	20.3	20.0	102	64 - 138
4-Methyl-2-pentanone	20.6	20.0	103	64 - 136
Acetone	20.9	20.0	104	55 - 159
Benzene	18.9	20.0	94	76 - 119
Bromodichloromethane	19.0	20.0	95	75 - 124
Bromoform	19.5	20.0	98	67 - 129
Bromomethane	18.5	20.0	92	53 - 143
Carbon Disulfide	18.7	20.0	94	58 - 139
Carbon Tetrachloride	19.7	20.0	99	62 - 136
Chlorobenzene	18.6	20.0	93	75 - 122
Chloroethane	20.0	20.0	100	70 - 130
Chloroform	18.8	20.0	94	77 - 123
Chloromethane	18.9	20.0	95	60 - 137
Dibromochloromethane	18.7	20.0	93	70 - 133
Dichloromethane	18.5	20.0	93	76 - 121
Ethylbenzene	19.0	20.0	95	73 - 125
Styrene	17.6	20.0	88	76 - 132
Tetrachloroethene (PCE)	19.7	20.0	98	71 - 132
Toluene	18.7	20.0	94	75 - 122
Trichloroethene (TCE)	19.0	20.0	95	74 - 122
Vinyl Chloride	21.7	20.0	108	71 - 138
cis-1,2-Dichloroethene	17.7	20.0	89	75 - 119
cis-1,3-Dichloropropene	18.4	20.0	92	76 - 122
m,p-Xylenes	37.7	40.0	94	70 - 128

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 TR0272
Sample Matrix: Soil

Service Request: R1100446
Date Analyzed: 1/25/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry
Analysis Lot: 233307

Lab Control Sample
RQ1100582-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
o-Xylene	18.4	20.0	92	69 - 126
trans-1,2-Dichloroethene	18.5	20.0	93	73 - 121
trans-1,3-Dichloropropene	17.4	20.0	87	73 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP LC34 TR0272
 Sample Matrix: Soil

Service Request: R1100446
 Date Analyzed: 1/26/11

Lab Control Sample Summary
 TCLP Volatile Organics by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: As Received
 Analysis Lot: 233944

Lab Control Sample
 RQ1100814-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1-Dichloroethene (1,1-DCE)	19.7	20.0	98	72 - 129
1,2-Dichloroethane	20.5	20.0	102	78 - 126
2-Butanone (MEK)	21.1	20.0	106	60 - 133
Benzene	18.7	20.0	94	78 - 121
Carbon Tetrachloride	18.6	20.0	93	69 - 135
Chlorobenzene	18.9	20.0	94	80 - 121
Chloroform	19.6	20.0	98	78 - 125
Tetrachloroethene (PCE)	18.6	20.0	93	72 - 131
Trichloroethene (TCE)	18.5	20.0	92	74 - 127
Vinyl Chloride	24.1	20.0	120	71 - 136

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1 Mustard Street, Suite 250, Rochester, NY 14609 | 585.288.5380 | 800.695.7222 | 585.288.8475 (fax) PAGE 1 OF 1

Project Name ESTCP LC34		Project Number TR0272		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager Rebecca Dapporto		Report CC		PRESERVATIVE	
Company/Address Geosyntec Consultants 6770 S. Washington Ave Suite 3 Titusville, FL 32780		E-mail Rdapporto@geosyntec.com		PRELIMINARY TESTS <input type="checkbox"/> METALS, TOTAL <input type="checkbox"/> METALS, DISCRETE (List in comments below) <input type="checkbox"/> TCLP VOCs EPA 1311 <input type="checkbox"/> VOCs (Low level/trace)	
Phone # 321-269-5889		Sampler's Signature [Signature]		REMARKS/ ALTERNATE DESCRIPTION	
Sampler's Name Neil Stapley		FOR OFFICE USE ONLY LAB ID 001		DATE 11/24/11	
CLIENT SAMPLE ID LC34-WS001-000-2011034		SAMPLING TIME 0845		MATRIX Soil	
SPECIAL INSTRUCTIONS/COMMENTS Metals RCRA		TURNAROUND REQUIREMENTS RUSH (SURCHARGES APPLY) <input type="checkbox"/> 1 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input type="checkbox"/> Standard		REPORT REQUIREMENTS <input type="checkbox"/> I. Results Only <input checked="" type="checkbox"/> II. Results + QC Summaries (LCS, DUP, MS/MSD as required) <input type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with R	
See OAPP <input type="checkbox"/>		REQUESTED REPORT DATE		INVOICE INFORMATION PO #: BILL TO: TR0272 104	
STATE WHERE SAMPLES WERE COLLECTED: Florida		RECEIVED BY Fed Ex		R1100446 GeoSyntec Consultants ESTCP LC34 TR0272	
RELINQUISHED BY [Signature]		RELINQUISHED BY [Signature]		Signature	
Printed Name Neil Stapley		Printed Name Daniel White		Printed Name	
Firm Geosyntec		Firm CAH		Firm	
Date/Time 11/24/11 1730		Date/Time 11/25/11/0924		Date/Time	

Abrev. Sample ID on Sample containers

Cooler Receipt And Preservation Check Form

Project/Client Geosmtc Folder Number R1100446

Cooler received on 1/25/11 by: DFW COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? ~~YES~~ YES NO
 3. Did all bottles arrive in good condition (unbroken)? ~~YES~~ YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO ~~N/A~~
 5. Were ~~Ice~~ or Ice packs present? ~~YES~~ YES NO
 6. Where did the bottles originate? ~~CAS/ROC~~ CAS/ROC, CLIENT
 7. Temperature of cooler(s) upon receipt: 1.4°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 1/25/11 / 0936

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: Temp ~~Blank~~ / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 1/25/11

Cooler Breakdown: Date: 1/25/11 Time: 1105 by: DFW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? ~~YES~~ YES NO
 2. Did all bottle labels and tags agree with custody papers? ~~YES~~ YES NO
 3. Were correct containers used for the tests indicated? ~~YES~~ YES NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated ~~N/A~~
- Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH									
≤2	HNO ₃									
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						No = Samples were preserved at lab as listed PM OK to Adjust:
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet				
	Zn Aceta	-	-							
	HCl	*	*							

Bottle lot numbers: 092710-1M, 081610-166, 80826107E

Other Comments: _____

PC Secondary Review: KB 2/1/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



A FULL SERVICE ENVIRONMENTAL LABORATORY

May 5, 2011

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, Ontario, Canada N1G 5G3

Re: Project: ESTCP PED LC34/TRO272
CAS Submission # R1101575 Revised

Dear Mr. Repta,

Enclosed is the revised analytical data report for the above referenced project. The initial report did not meet the NASA requirements for issuing 1 data point per location per compound. We have revised this report to merge all VOC data and report any standard calibration exceedences from the diluted analytical run. All TOC data is reported as the average of the quad results.

Please contact me at (585)-288-5380 if you have questions regarding this information.

Sincerely,
COLUMBIA ANALYTICAL SERVICES

A handwritten signature in black ink that reads "Karen Bunker". The signature is written in a cursive, flowing style.

Karen Bunker
Project Manager

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272 3/22,28,29/11
Sample Matrix: Water

Service Request No.: R1101575
Date Received: 3/24,30/11

CASE NARRATIVE
Revised: 5/5/11

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-four (24) water samples including two (2) Trip Blanks were collected by the client on 3/22/11, 3/28-29/11 and were received for analysis at Columbia Analytical Services on 3/24/11 and 3/30/11 via a national courier. The samples were received at sample temperatures of 6 and 3°C respectively, within the 0-6°C guidelines. One (1) Trip Blank vial had air bubbles in 1 of the 3 vials received for the samples, no data is affected.

Several Sample ID's were revised as per a client email from 4/5/11. Permission to analyze Trip Blank LC34-TB 20110322-01 from 3/24/11 (not noted on the Chain of Custody) was given via the client on 3/25/11.

Volatile Organic Compounds

Twenty-four (24) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) water samples were analyzed for gases by GC method RSK 175.

Initial and Continuing Calibration Criteria was met for all samples except the following 8260 compounds:

Dichlorodifluoromethane %Differences (%D) was out at -27.2 (criteria is $\pm 20\%$) on the 3/28/11 CCV
n-Butanol (-33.4), MEK (-21.9), Acetone (-27.4), and Dichlorodifluoromethane (26.6) were outside limits on the 3/29/11 CCV.

When CCV %D criteria are not met, it may indicate some bias in the quantitation for that target compound in the associated samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD- RSK's only) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

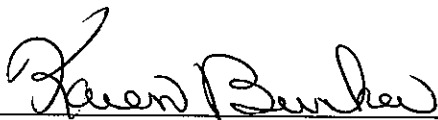
Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Samples were analyzed within 7 days from collection, the holding time for unpreserved vials.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date



000002

HPLC Methodology

Two (2) water samples were analyzed for Organic Acids by HPLC.

All Initial and Continuing Calibration Criteria were met.

Batch QC is included in the report. All LCS and LCSD recoveries were within QC acceptance limits. All RPD calculations were acceptable.

All samples were analyzed within the proper holding time for the method.

The Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Inorganic Parameters

Two (2) water samples were analyzed for TOC by method 9060 and Bromide and Iodide by IC method 300.0. Two (2) additional water samples were analyzed for Bromide, Iodide, TOC and Sulfide by method SM4500-S2-F, Chloride, Nitrate and Nitrite by IC Method 300.0, and Alkalinity by SM2320 B. The TOC Quad average has been reported.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met except for the Nitrate and Nitrite analyses which were received outside the 48 hour holding time for these methods. The data is flagged as "*". The analyses were completed as soon as possible upon receipt at the laboratory.

Location LC34-RW0007-038.5-20110328 (CAS Submission # R1101575-013) was repeated for Nitrite due to carry over from a nearby peak on the initial run. As per client instructions, only the latter data has been reported.

All Laboratory Method Blanks were free from contamination.

Approved by Jean Burke Date 5/5/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1101575

<u>Lab ID</u>	<u>Client ID</u>
R1101575-001	LC34-RW0007-038.5-20110322
R1101575-002	LC34-IW0002I-027.5-20110322
R1101575-003	LC34-IW0002D-037.5-20110322
R1101575-004	LC34-BW0001C-038.5-20110322
R1101575-005	LC34-BW0002C-038.5-20110322
R1101575-006	LC34-BW0003C-038.5-20110322
R1101575-007	LC34-RW0008-052.0-20110322
R1101575-008	LC34-IW0002D1-052.5-20110322
R1101575-009	LC34-BW0001E-052.5-20110322
R1101575-010	LC34-BW0003E-052.5-20110322
R1101575-011	LC34-FD-20010322-01
R1101575-012	LC34-TB-20110322-01
R1101575-013	LC34-RW0007-038.5-20110328
R1101575-014	LC34-IW0002I-027.5-20110329
R1101575-015	LC34-IW0002D-037.5-20110328
R1101575-016	LC34-BW0001C-038.5-20110329
R1101575-017	LC34-BW0002C-038.5-20110329
R1101575-018	LC34-BW0003C-038.5-20110329
R1101575-019	LC34-RW0008-052.0-20110328
R1101575-020	LC34-IW0002DI-052.5-20110328
R1101575-021	LC34-BW0001E-052.5-20110329
R1101575-022	LC34-BW0003E-052.5-20110329
R1101575-023	LC34-FD-20110328-01
R1101575-024	LC34-TB-20110329-01

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110322
Lab Code: R1101575-001

Service Request: R1101575
Date Collected: 3/22/11 1029
Date Received: 3/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.7	mg/L	1.0	10	NA	3/29/11 19:51	
Carbon, Total Organic (TOC), Average	9060	5.3	mg/L	1.0	1	NA	3/25/11 22:38	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	4/7/11 14:08	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110322
 Lab Code: R1101575-001

Service Request: R1101575
 Date Collected: 3/22/11 1029
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	7400		1300	100	250	NA	3/29/11 14:16		240517	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	3/29/11 14:16		240517	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	3/29/11 14:16		240517	
1,2-Dibromoethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	3/29/11 14:16		240517	
1,2-Dichloroethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
1,2-Dichloropropane	1300	U	1300	170	250	NA	3/29/11 14:16		240517	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	3/29/11 14:16		240517	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	3/29/11 14:16		240517	
n-Butanol	13000	U	13000	1700	250	NA	3/29/11 14:16		240517	
2-Butanone (MEK)	2500	U	2500	250	250	NA	3/29/11 14:16		240517	
2-Hexanone	2500	U	2500	100	250	NA	3/29/11 14:16		240517	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	3/29/11 14:16		240517	
Acetone	5000	U	5000	400	250	NA	3/29/11 14:16		240517	
Benzene	1300	U	1300	78	250	NA	3/29/11 14:16		240517	
Bromodichloromethane	1300	U	1300	110	250	NA	3/29/11 14:16		240517	
Bromoform	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Bromomethane	1300	U	1300	100	250	NA	3/29/11 14:16		240517	
Carbon Disulfide	2500	U	2500	88	250	NA	3/29/11 14:16		240517	
Carbon Tetrachloride	1300	U	1300	90	250	NA	3/29/11 14:16		240517	
Chlorobenzene	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Chloroethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Chloroform	100	J	1300	75	250	NA	3/29/11 14:16		240517	
Chloromethane	1300	U	1300	120	250	NA	3/29/11 14:16		240517	
Cyclohexane	2500	U	2500	75	250	NA	3/29/11 14:16		240517	
Dibromochloromethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	3/29/11 14:16		240517	
Dichloromethane	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Ethylbenzene	1300	U	1300	110	250	NA	3/29/11 14:16		240517	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	3/29/11 14:16		240517	
Methyl Acetate	2500	U	2500	170	250	NA	3/29/11 14:16		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110322
Lab Code: R1101575-001

Service Request: R1101575
Date Collected: 3/22/11 1029
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Methylcyclohexane	2500	U	2500	75	250	NA	3/29/11 14:16		240517	
Styrene	1300	U	1300	88	250	NA	3/29/11 14:16		240517	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	3/29/11 14:16		240517	
Toluene	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
Trichloroethene (TCE)	14000		1300	75	250	NA	3/29/11 14:16		240517	
Trichlorofluoromethane (CFC 11)	120	J	1300	75	250	NA	3/29/11 14:16		240517	
Vinyl Chloride	610	J	1300	75	250	NA	3/29/11 14:16		240517	
cis-1,2-Dichloroethene	27000		1300	75	250	NA	3/29/11 14:16		240517	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
m,p-Xylenes	1300	U	1300	210	250	NA	3/29/11 14:16		240517	
n-Butyl Acetate	1300	U	1300	75	250	NA	3/29/11 14:16		240517	
o-Xylene	1300	U	1300	100	250	NA	3/29/11 14:16		240517	
trans-1,2-Dichloroethene	210	J	1300	75	250	NA	3/29/11 14:16		240517	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 14:16		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	3/29/11 14:16	
Dibromofluoromethane	102	89-119	3/29/11 14:16	
Toluene-d8	101	87-121	3/29/11 14:16	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/22/11 1029
Date Received: 3/24/11
Date Analyzed: 3/24/11 17:33

Sample Name: LC34-RW0007-038.5-20110322
Lab Code: R1101575-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\032411\X0005581.D\

Analysis Lot: 240058
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	33	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.2	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20110322
 Lab Code: R1101575-002

Service Request: R1101575
 Date Collected: 3/22/11 1434
 Date Received: 3/24/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	53000		2500	200	500	NA	3/28/11 14:07		240184	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	3/28/11 14:07		240184	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	3/28/11 14:07		240184	
1,2-Dibromoethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	3/28/11 14:07		240184	
1,2-Dichloroethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
1,2-Dichloropropane	2500	U	2500	330	500	NA	3/28/11 14:07		240184	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	3/28/11 14:07		240184	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	3/28/11 14:07		240184	
n-Butanol	25000	U	25000	3400	500	NA	3/28/11 14:07		240184	
2-Butanone (MEK)	5000	U	5000	500	500	NA	3/28/11 14:07		240184	
2-Hexanone	5000	U	5000	200	500	NA	3/28/11 14:07		240184	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	3/28/11 14:07		240184	
Acetone	10000	U	10000	800	500	NA	3/28/11 14:07		240184	
Benzene	2500	U	2500	160	500	NA	3/28/11 14:07		240184	
Bromodichloromethane	2500	U	2500	210	500	NA	3/28/11 14:07		240184	
Bromoform	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Bromomethane	2500	U	2500	200	500	NA	3/28/11 14:07		240184	
Carbon Disulfide	5000	U	5000	180	500	NA	3/28/11 14:07		240184	
Carbon Tetrachloride	2500	U	2500	180	500	NA	3/28/11 14:07		240184	
Chlorobenzene	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Chloroethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Chloroform	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Chloromethane	2500	U	2500	230	500	NA	3/28/11 14:07		240184	
Cyclohexane	5000	U	5000	150	500	NA	3/28/11 14:07		240184	
Dibromochloromethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	3/28/11 14:07		240184	
Dichloromethane	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Ethylbenzene	2500	U	2500	210	500	NA	3/28/11 14:07		240184	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	3/28/11 14:07		240184	
Methyl Acetate	5000	U	5000	330	500	NA	3/28/11 14:07		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110322
Lab Code: R1101575-002

Service Request: R1101575
Date Collected: 3/22/11 1434
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Methylcyclohexane	5000	U	5000	150	500	NA	3/28/11 14:07		240184	
Styrene	2500	U	2500	180	500	NA	3/28/11 14:07		240184	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	3/28/11 14:07		240184	
Toluene	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Trichloroethene (TCE)	200	J	2500	150	500	NA	3/28/11 14:07		240184	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
Vinyl Chloride	1100	J	2500	150	500	NA	3/28/11 14:07		240184	
cis-1,2-Dichloroethene	27000		2500	150	500	NA	3/28/11 14:07		240184	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
m,p-Xylenes	2500	U	2500	410	500	NA	3/28/11 14:07		240184	
n-Butyl Acetate	2500	U	2500	150	500	NA	3/28/11 14:07		240184	
o-Xylene	2500	U	2500	200	500	NA	3/28/11 14:07		240184	
trans-1,2-Dichloroethene	550	J	2500	150	500	NA	3/28/11 14:07		240184	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	3/28/11 14:07		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	3/28/11 14:07	
Dibromofluoromethane	105	89-119	3/28/11 14:07	
Toluene-d8	103	87-121	3/28/11 14:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D-037.5-20110322
 Lab Code: R1101575-003

Service Request: R1101575
 Date Collected: 3/22/11 1405
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	190	J	1300	100	250	NA	3/29/11 14:44		240517	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	3/29/11 14:44		240517	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	3/29/11 14:44		240517	
1,2-Dibromoethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	3/29/11 14:44		240517	
1,2-Dichloroethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
1,2-Dichloropropane	1300	U	1300	170	250	NA	3/29/11 14:44		240517	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	3/29/11 14:44		240517	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	3/29/11 14:44		240517	
n-Butanol	13000	U	13000	1700	250	NA	3/29/11 14:44		240517	
2-Butanone (MEK)	2500	U	2500	250	250	NA	3/29/11 14:44		240517	
2-Hexanone	2500	U	2500	100	250	NA	3/29/11 14:44		240517	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	3/29/11 14:44		240517	
Acetone	5000	U	5000	400	250	NA	3/29/11 14:44		240517	
Benzene	1300	U	1300	78	250	NA	3/29/11 14:44		240517	
Bromodichloromethane	1300	U	1300	110	250	NA	3/29/11 14:44		240517	
Bromoform	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Bromomethane	1300	U	1300	100	250	NA	3/29/11 14:44		240517	
Carbon Disulfide	2500	U	2500	88	250	NA	3/29/11 14:44		240517	
Carbon Tetrachloride	1300	U	1300	90	250	NA	3/29/11 14:44		240517	
Chlorobenzene	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Chloroethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Chloroform	120	J	1300	75	250	NA	3/29/11 14:44		240517	
Chloromethane	1300	U	1300	120	250	NA	3/29/11 14:44		240517	
Cyclohexane	2500	U	2500	75	250	NA	3/29/11 14:44		240517	
Dibromochloromethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	3/29/11 14:44		240517	
Dichloromethane	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Ethylbenzene	1300	U	1300	110	250	NA	3/29/11 14:44		240517	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	3/29/11 14:44		240517	
Methyl Acetate	2500	U	2500	170	250	NA	3/29/11 14:44		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110322
Lab Code: R1101575-003

Service Request: R1101575
Date Collected: 3/22/11 1405
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Methylcyclohexane	2500	U	2500	75	250	NA	3/29/11 14:44		240517	
Styrene	1300	U	1300	88	250	NA	3/29/11 14:44		240517	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	3/29/11 14:44		240517	
Toluene	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Trichloroethene (TCE)	3100		1300	75	250	NA	3/29/11 14:44		240517	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
Vinyl Chloride	1300	J	1300	75	250	NA	3/29/11 14:44		240517	
cis-1,2-Dichloroethene	25000		1300	75	250	NA	3/29/11 14:44		240517	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
m,p-Xylenes	1300	U	1300	210	250	NA	3/29/11 14:44		240517	
n-Butyl Acetate	1300	U	1300	75	250	NA	3/29/11 14:44		240517	
o-Xylene	1300	U	1300	100	250	NA	3/29/11 14:44		240517	
trans-1,2-Dichloroethene	260	J	1300	75	250	NA	3/29/11 14:44		240517	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 14:44		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	3/29/11 14:44	
Dibromofluoromethane	104	89-119	3/29/11 14:44	
Toluene-d8	103	87-121	3/29/11 14:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110322
Lab Code: R1101575-004

Service Request: R1101575
Date Collected: 3/22/11 1501
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	26000		1300	100	250	NA	3/29/11 15:11		240517	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	3/29/11 15:11		240517	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	3/29/11 15:11		240517	
1,2-Dibromoethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	3/29/11 15:11		240517	
1,2-Dichloroethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
1,2-Dichloropropane	1300	U	1300	170	250	NA	3/29/11 15:11		240517	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	3/29/11 15:11		240517	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	3/29/11 15:11		240517	
n-Butanol	13000	U	13000	1700	250	NA	3/29/11 15:11		240517	
2-Butanone (MEK)	2500	U	2500	250	250	NA	3/29/11 15:11		240517	
2-Hexanone	2500	U	2500	100	250	NA	3/29/11 15:11		240517	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	3/29/11 15:11		240517	
Acetone	1800	J	5000	400	250	NA	3/29/11 15:11		240517	
Benzene	1300	U	1300	78	250	NA	3/29/11 15:11		240517	
Bromodichloromethane	1300	U	1300	110	250	NA	3/29/11 15:11		240517	
Bromoform	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Bromomethane	1300	U	1300	100	250	NA	3/29/11 15:11		240517	
Carbon Disulfide	2500	U	2500	88	250	NA	3/29/11 15:11		240517	
Carbon Tetrachloride	1300	U	1300	90	250	NA	3/29/11 15:11		240517	
Chlorobenzene	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Chloroethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Chloroform	150	J	1300	75	250	NA	3/29/11 15:11		240517	
Chloromethane	1300	U	1300	120	250	NA	3/29/11 15:11		240517	
Cyclohexane	2500	U	2500	75	250	NA	3/29/11 15:11		240517	
Dibromochloromethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	3/29/11 15:11		240517	
Dichloromethane	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Ethylbenzene	1300	U	1300	110	250	NA	3/29/11 15:11		240517	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	3/29/11 15:11		240517	
Methyl Acetate	2500	U	2500	170	250	NA	3/29/11 15:11		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110322
Lab Code: R1101575-004

Service Request: R1101575
Date Collected: 3/22/11 1501
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Methylcyclohexane	2500	U	2500	75	250	NA	3/29/11 15:11		240517	
Styrene	1300	U	1300	88	250	NA	3/29/11 15:11		240517	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	3/29/11 15:11		240517	
Toluene	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Trichloroethene (TCE)	48000		1300	75	250	NA	3/29/11 15:11		240517	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
Vinyl Chloride	420	J	1300	75	250	NA	3/29/11 15:11		240517	
cis-1,2-Dichloroethene	28000		1300	75	250	NA	3/29/11 15:11		240517	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
m,p-Xylenes	1300	U	1300	210	250	NA	3/29/11 15:11		240517	
n-Butyl Acetate	1300	U	1300	75	250	NA	3/29/11 15:11		240517	
o-Xylene	1300	U	1300	100	250	NA	3/29/11 15:11		240517	
trans-1,2-Dichloroethene	240	J	1300	75	250	NA	3/29/11 15:11		240517	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/29/11 15:11		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	3/29/11 15:11	
Dibromofluoromethane	103	89-119	3/29/11 15:11	
Toluene-d8	102	87-121	3/29/11 15:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110322
Lab Code: R1101575-005

Service Request: R1101575
Date Collected: 3/22/11 1253
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	100	250	NA	3/28/11 15:29		240184	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	3/28/11 15:29		240184	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	3/28/11 15:29		240184	
1,2-Dibromoethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	3/28/11 15:29		240184	
1,2-Dichloroethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
1,2-Dichloropropane	1300	U	1300	170	250	NA	3/28/11 15:29		240184	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	3/28/11 15:29		240184	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	3/28/11 15:29		240184	
n-Butanol	13000	U	13000	1700	250	NA	3/28/11 15:29		240184	
2-Butanone (MEK)	2500	U	2500	250	250	NA	3/28/11 15:29		240184	
2-Hexanone	2500	U	2500	100	250	NA	3/28/11 15:29		240184	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	3/28/11 15:29		240184	
Acetone	5000	U	5000	400	250	NA	3/28/11 15:29		240184	
Benzene	1300	U	1300	78	250	NA	3/28/11 15:29		240184	
Bromodichloromethane	1300	U	1300	110	250	NA	3/28/11 15:29		240184	
Bromoform	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Bromomethane	1300	U	1300	100	250	NA	3/28/11 15:29		240184	
Carbon Disulfide	2500	U	2500	88	250	NA	3/28/11 15:29		240184	
Carbon Tetrachloride	1300	U	1300	90	250	NA	3/28/11 15:29		240184	
Chlorobenzene	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Chloroethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Chloroform	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Chloromethane	1300	U	1300	120	250	NA	3/28/11 15:29		240184	
Cyclohexane	2500	U	2500	75	250	NA	3/28/11 15:29		240184	
Dibromochloromethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	3/28/11 15:29		240184	
Dichloromethane	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Ethylbenzene	1300	U	1300	110	250	NA	3/28/11 15:29		240184	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	3/28/11 15:29		240184	
Methyl Acetate	2500	U	2500	170	250	NA	3/28/11 15:29		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002C-038.5-20110322
 Lab Code: R1101575-005

Service Request: R1101575
 Date Collected: 3/22/11 1253
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Methylcyclohexane	2500	U	2500	75	250	NA	3/28/11 15:29		240184	
Styrene	1300	U	1300	88	250	NA	3/28/11 15:29		240184	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	3/28/11 15:29		240184	
Toluene	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Trichloroethene (TCE)	2900		1300	75	250	NA	3/28/11 15:29		240184	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
Vinyl Chloride	2500		1300	75	250	NA	3/28/11 15:29		240184	
cis-1,2-Dichloroethene	66000	D	2500	150	500	NA	3/29/11 15:38		240517	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
m,p-Xylenes	1300	U	1300	210	250	NA	3/28/11 15:29		240184	
n-Butyl Acetate	1300	U	1300	75	250	NA	3/28/11 15:29		240184	
o-Xylene	1300	U	1300	100	250	NA	3/28/11 15:29		240184	
trans-1,2-Dichloroethene	430	J	1300	75	250	NA	3/28/11 15:29		240184	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	3/28/11 15:29		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	3/28/11 15:29	
Dibromofluoromethane	106	89-119	3/28/11 15:29	
Toluene-d8	107	87-121	3/28/11 15:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110322
Lab Code: R1101575-006

Service Request: R1101575
Date Collected: 3/22/11 1621
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,1,2,2-Tetrachloroethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,1,2-Trichloroethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	40	100	NA	3/29/11 16:06		240517	
1,1-Dichloroethane (1,1-DCA)	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,1-Dichloroethene (1,1-DCE)	500	U	500	37	100	NA	3/29/11 16:06		240517	
1,2,4-Trichlorobenzene	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	100	NA	3/29/11 16:06		240517	
1,2-Dibromoethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,2-Dichlorobenzene	500	U	500	40	100	NA	3/29/11 16:06		240517	
1,2-Dichloroethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
1,2-Dichloropropane	500	U	500	66	100	NA	3/29/11 16:06		240517	
1,3-Dichlorobenzene	500	U	500	36	100	NA	3/29/11 16:06		240517	
1,4-Dichlorobenzene	500	U	500	34	100	NA	3/29/11 16:06		240517	
n-Butanol	5000	U	5000	670	100	NA	3/29/11 16:06		240517	
2-Butanone (MEK)	1000	U	1000	100	100	NA	3/29/11 16:06		240517	
2-Hexanone	1000	U	1000	40	100	NA	3/29/11 16:06		240517	
4-Methyl-2-pentanone	1000	U	1000	34	100	NA	3/29/11 16:06		240517	
Acetone	2000	U	2000	160	100	NA	3/29/11 16:06		240517	
Benzene	500	U	500	31	100	NA	3/29/11 16:06		240517	
Bromodichloromethane	500	U	500	41	100	NA	3/29/11 16:06		240517	
Bromoform	500	U	500	30	100	NA	3/29/11 16:06		240517	
Bromomethane	500	U	500	40	100	NA	3/29/11 16:06		240517	
Carbon Disulfide	1000	U	1000	35	100	NA	3/29/11 16:06		240517	
Carbon Tetrachloride	500	U	500	36	100	NA	3/29/11 16:06		240517	
Chlorobenzene	500	U	500	30	100	NA	3/29/11 16:06		240517	
Chloroethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
Chloroform	46	J	500	30	100	NA	3/29/11 16:06		240517	
Chloromethane	500	U	500	46	100	NA	3/29/11 16:06		240517	
Cyclohexane	1000	U	1000	30	100	NA	3/29/11 16:06		240517	
Dibromochloromethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
Dichlorodifluoromethane (CFC 12)	500	U	500	73	100	NA	3/29/11 16:06		240517	
Dichloromethane	500	U	500	30	100	NA	3/29/11 16:06		240517	
Ethylbenzene	500	U	500	42	100	NA	3/29/11 16:06		240517	
Isopropylbenzene (Cumene)	500	U	500	34	100	NA	3/29/11 16:06		240517	
Methyl Acetate	1000	U	1000	66	100	NA	3/29/11 16:06		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110322
 Lab Code: R1101575-006

Service Request: R1101575
 Date Collected: 3/22/11 1621
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500 U	500	30	100	NA	3/29/11 16:06		240517	
Methylcyclohexane	1000 U	1000	30	100	NA	3/29/11 16:06		240517	
Styrene	500 U	500	35	100	NA	3/29/11 16:06		240517	
Tetrachloroethene (PCE)	500 U	500	42	100	NA	3/29/11 16:06		240517	
Toluene	500 U	500	30	100	NA	3/29/11 16:06		240517	
Trichloroethene (TCE)	65 J	500	30	100	NA	3/29/11 16:06		240517	
Trichlorofluoromethane (CFC 11)	500 U	500	30	100	NA	3/29/11 16:06		240517	
Vinyl Chloride	3200	500	30	100	NA	3/29/11 16:06		240517	
cis-1,2-Dichloroethene	12000	500	30	100	NA	3/29/11 16:06		240517	
cis-1,3-Dichloropropene	500 U	500	30	100	NA	3/29/11 16:06		240517	
m,p-Xylenes	500 U	500	81	100	NA	3/29/11 16:06		240517	
n-Butyl Acetate	500 U	500	30	100	NA	3/29/11 16:06		240517	
o-Xylene	500 U	500	40	100	NA	3/29/11 16:06		240517	
trans-1,2-Dichloroethene	110 J	500	30	100	NA	3/29/11 16:06		240517	
trans-1,3-Dichloropropene	500 U	500	30	100	NA	3/29/11 16:06		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	3/29/11 16:06	
Dibromofluoromethane	104	89-119	3/29/11 16:06	
Toluene-d8	102	87-121	3/29/11 16:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110322
Lab Code: R1101575-007

Service Request: R1101575
Date Collected: 3/22/11 1121
Date Received: 3/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.1	mg/L	1.0	10	NA	3/29/11 20:31	
Carbon, Total Organic (TOC), Average	9060	3.6	mg/L	1.0	1	NA	3/25/11 23:13	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	4/7/11 14:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110322
Lab Code: R1101575-007

Service Request: R1101575
Date Collected: 3/22/11 1121
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,1,2,2-Tetrachloroethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,1,2-Trichloroethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	190		50	4.0	10	NA	3/29/11 16:33		240517	
1,1-Dichloroethane (1,1-DCA)	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,1-Dichloroethene (1,1-DCE)	50	U	50	3.7	10	NA	3/29/11 16:33		240517	
1,2,4-Trichlorobenzene	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	4.3	10	NA	3/29/11 16:33		240517	
1,2-Dibromoethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,2-Dichlorobenzene	50	U	50	4.0	10	NA	3/29/11 16:33		240517	
1,2-Dichloroethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
1,2-Dichloropropane	50	U	50	6.7	10	NA	3/29/11 16:33		240517	
1,3-Dichlorobenzene	50	U	50	3.6	10	NA	3/29/11 16:33		240517	
1,4-Dichlorobenzene	50	U	50	3.5	10	NA	3/29/11 16:33		240517	
n-Butanol	500	U	500	67	10	NA	3/29/11 16:33		240517	
2-Butanone (MEK)	100	U	100	10	10	NA	3/29/11 16:33		240517	
2-Hexanone	100	U	100	4.0	10	NA	3/29/11 16:33		240517	
4-Methyl-2-pentanone	100	U	100	3.5	10	NA	3/29/11 16:33		240517	
Acetone	200	U	200	16	10	NA	3/29/11 16:33		240517	
Benzene	50	U	50	3.1	10	NA	3/29/11 16:33		240517	
Bromodichloromethane	50	U	50	4.1	10	NA	3/29/11 16:33		240517	
Bromoform	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Bromomethane	50	U	50	4.0	10	NA	3/29/11 16:33		240517	
Carbon Disulfide	100	U	100	3.5	10	NA	3/29/11 16:33		240517	
Carbon Tetrachloride	50	U	50	3.6	10	NA	3/29/11 16:33		240517	
Chlorobenzene	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Chloroethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Chloroform	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Chloromethane	50	U	50	4.7	10	NA	3/29/11 16:33		240517	
Cyclohexane	100	U	100	3.0	10	NA	3/29/11 16:33		240517	
Dibromochloromethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Dichlorodifluoromethane (CFC 12)	50	U	50	7.3	10	NA	3/29/11 16:33		240517	
Dichloromethane	50	U	50	3.0	10	NA	3/29/11 16:33		240517	
Ethylbenzene	50	U	50	4.2	10	NA	3/29/11 16:33		240517	
Isopropylbenzene (Cumene)	50	U	50	3.5	10	NA	3/29/11 16:33		240517	
Methyl Acetate	100	U	100	6.7	10	NA	3/29/11 16:33		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110322
Lab Code: R1101575-007

Service Request: R1101575
Date Collected: 3/22/11 1121
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50 U	50	3.0	10	NA	3/29/11 16:33		240517	
Methylcyclohexane	100 U	100	3.0	10	NA	3/29/11 16:33		240517	
Styrene	50 U	50	3.5	10	NA	3/29/11 16:33		240517	
Tetrachloroethene (PCE)	50 U	50	4.2	10	NA	3/29/11 16:33		240517	
Toluene	50 U	50	3.0	10	NA	3/29/11 16:33		240517	
Trichloroethene (TCE)	1300	50	3.0	10	NA	3/29/11 16:33		240517	
Trichlorofluoromethane (CFC 11)	50 U	50	3.0	10	NA	3/29/11 16:33		240517	
Vinyl Chloride	34 J	50	3.0	10	NA	3/29/11 16:33		240517	
cis-1,2-Dichloroethene	450	50	3.0	10	NA	3/29/11 16:33		240517	
cis-1,3-Dichloropropene	50 U	50	3.0	10	NA	3/29/11 16:33		240517	
m,p-Xylenes	50 U	50	8.2	10	NA	3/29/11 16:33		240517	
n-Butyl Acetate	50 U	50	3.0	10	NA	3/29/11 16:33		240517	
o-Xylene	50 U	50	4.0	10	NA	3/29/11 16:33		240517	
trans-1,2-Dichloroethene	3.0 J	50	3.0	10	NA	3/29/11 16:33		240517	
trans-1,3-Dichloropropene	50 U	50	3.0	10	NA	3/29/11 16:33		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	3/29/11 16:33	
Dibromofluoromethane	105	89-119	3/29/11 16:33	
Toluene-d8	103	87-121	3/29/11 16:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/22/11 1121
Date Received: 3/24/11
Date Analyzed: 3/24/11 19:53

Sample Name: LC34-RW0008-052.0-20110322
Lab Code: R1101575-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\032411\X0005584.D\

Analysis Lot: 240058
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20110322
 Lab Code: R1101575-008

Service Request: R1101575
 Date Collected: 3/22/11 1330
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,1,2,2-Tetrachloroethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,1,2-Trichloroethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	6.9	J	13	1.0	2.5	NA	3/29/11 17:01		240517	
1,1-Dichloroethane (1,1-DCA)	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,1-Dichloroethene (1,1-DCE)	13	U	13	0.93	2.5	NA	3/29/11 17:01		240517	
1,2,4-Trichlorobenzene	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.1	2.5	NA	3/29/11 17:01		240517	
1,2-Dibromoethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,2-Dichlorobenzene	13	U	13	1.0	2.5	NA	3/29/11 17:01		240517	
1,2-Dichloroethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
1,2-Dichloropropane	13	U	13	1.7	2.5	NA	3/29/11 17:01		240517	
1,3-Dichlorobenzene	13	U	13	0.90	2.5	NA	3/29/11 17:01		240517	
1,4-Dichlorobenzene	13	U	13	0.86	2.5	NA	3/29/11 17:01		240517	
n-Butanol	130	U	130	17	2.5	NA	3/29/11 17:01		240517	
2-Butanone (MEK)	25	U	25	2.5	2.5	NA	3/29/11 17:01		240517	
2-Hexanone	25	U	25	1.0	2.5	NA	3/29/11 17:01		240517	
4-Methyl-2-pentanone	25	U	25	0.86	2.5	NA	3/29/11 17:01		240517	
Acetone	50	U	50	4.0	2.5	NA	3/29/11 17:01		240517	
Benzene	13	U	13	0.78	2.5	NA	3/29/11 17:01		240517	
Bromodichloromethane	13	U	13	1.1	2.5	NA	3/29/11 17:01		240517	
Bromoform	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Bromomethane	13	U	13	1.0	2.5	NA	3/29/11 17:01		240517	
Carbon Disulfide	25	U	25	0.88	2.5	NA	3/29/11 17:01		240517	
Carbon Tetrachloride	13	U	13	0.90	2.5	NA	3/29/11 17:01		240517	
Chlorobenzene	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Chloroethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Chloroform	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Chloromethane	13	U	13	1.2	2.5	NA	3/29/11 17:01		240517	
Cyclohexane	25	U	25	0.75	2.5	NA	3/29/11 17:01		240517	
Dibromochloromethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Dichlorodifluoromethane (CFC 12)	13	U	13	1.9	2.5	NA	3/29/11 17:01		240517	
Dichloromethane	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Ethylbenzene	13	U	13	1.1	2.5	NA	3/29/11 17:01		240517	
Isopropylbenzene (Cumene)	13	U	13	0.86	2.5	NA	3/29/11 17:01		240517	
Methyl Acetate	25	U	25	1.7	2.5	NA	3/29/11 17:01		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110322
Lab Code: R1101575-008

Service Request: R1101575
Date Collected: 3/22/11 1330
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Methylcyclohexane	25	U	25	0.75	2.5	NA	3/29/11 17:01		240517	
Styrene	13	U	13	0.88	2.5	NA	3/29/11 17:01		240517	
Tetrachloroethene (PCE)	13	U	13	1.1	2.5	NA	3/29/11 17:01		240517	
Toluene	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Trichloroethene (TCE)	260		13	0.75	2.5	NA	3/29/11 17:01		240517	
Trichlorofluoromethane (CFC 11)	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
Vinyl Chloride	3.3	J	13	0.75	2.5	NA	3/29/11 17:01		240517	
cis-1,2-Dichloroethene	380		13	0.75	2.5	NA	3/29/11 17:01		240517	
cis-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
m,p-Xylenes	13	U	13	2.1	2.5	NA	3/29/11 17:01		240517	
n-Butyl Acetate	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	
o-Xylene	13	U	13	1.0	2.5	NA	3/29/11 17:01		240517	
trans-1,2-Dichloroethene	2.5	J	13	0.75	2.5	NA	3/29/11 17:01		240517	
trans-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	3/29/11 17:01		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	3/29/11 17:01	
Dibromofluoromethane	105	89-119	3/29/11 17:01	
Toluene-d8	104	87-121	3/29/11 17:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20110322
 Lab Code: R1101575-009

Service Request: R1101575
 Date Collected: 3/22/11 1525
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,1,2,2-Tetrachloroethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,1,2-Trichloroethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	25	U	25	2.0	5	NA	3/29/11 17:28		240517	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,1-Dichloroethene (1,1-DCE)	25	U	25	1.9	5	NA	3/29/11 17:28		240517	
1,2,4-Trichlorobenzene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	2.2	5	NA	3/29/11 17:28		240517	
1,2-Dibromoethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,2-Dichlorobenzene	25	U	25	2.0	5	NA	3/29/11 17:28		240517	
1,2-Dichloroethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
1,2-Dichloropropane	25	U	25	3.4	5	NA	3/29/11 17:28		240517	
1,3-Dichlorobenzene	25	U	25	1.8	5	NA	3/29/11 17:28		240517	
1,4-Dichlorobenzene	25	U	25	1.8	5	NA	3/29/11 17:28		240517	
n-Butanol	250	U	250	34	5	NA	3/29/11 17:28		240517	
2-Butanone (MEK)	50	U	50	5.0	5	NA	3/29/11 17:28		240517	
2-Hexanone	50	U	50	2.0	5	NA	3/29/11 17:28		240517	
4-Methyl-2-pentanone	50	U	50	1.8	5	NA	3/29/11 17:28		240517	
Acetone	100	U	100	8.0	5	NA	3/29/11 17:28		240517	
Benzene	25	U	25	1.6	5	NA	3/29/11 17:28		240517	
Bromodichloromethane	25	U	25	2.1	5	NA	3/29/11 17:28		240517	
Bromoform	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Bromomethane	25	U	25	2.0	5	NA	3/29/11 17:28		240517	
Carbon Disulfide	50	U	50	1.8	5	NA	3/29/11 17:28		240517	
Carbon Tetrachloride	25	U	25	1.8	5	NA	3/29/11 17:28		240517	
Chlorobenzene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Chloroethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Chloroform	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Chloromethane	25	U	25	2.4	5	NA	3/29/11 17:28		240517	
Cyclohexane	50	U	50	1.5	5	NA	3/29/11 17:28		240517	
Dibromochloromethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Dichlorodifluoromethane (CFC 12)	25	U	25	3.7	5	NA	3/29/11 17:28		240517	
Dichloromethane	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Ethylbenzene	25	U	25	2.1	5	NA	3/29/11 17:28		240517	
Isopropylbenzene (Cumene)	25	U	25	1.8	5	NA	3/29/11 17:28		240517	
Methyl Acetate	50	U	50	3.4	5	NA	3/29/11 17:28		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110322
Lab Code: R1101575-009

Service Request: R1101575
Date Collected: 3/22/11 1525
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Methylcyclohexane	50	U	50	1.5	5	NA	3/29/11 17:28		240517	
Styrene	25	U	25	1.8	5	NA	3/29/11 17:28		240517	
Tetrachloroethene (PCE)	25	U	25	2.1	5	NA	3/29/11 17:28		240517	
Toluene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Trichloroethene (TCE)	590		25	1.5	5	NA	3/29/11 17:28		240517	
Trichlorofluoromethane (CFC 11)	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
Vinyl Chloride	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
cis-1,2-Dichloroethene	79		25	1.5	5	NA	3/29/11 17:28		240517	
cis-1,3-Dichloropropene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
m,p-Xylenes	25	U	25	4.1	5	NA	3/29/11 17:28		240517	
n-Butyl Acetate	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
o-Xylene	25	U	25	2.0	5	NA	3/29/11 17:28		240517	
trans-1,2-Dichloroethene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	
trans-1,3-Dichloropropene	25	U	25	1.5	5	NA	3/29/11 17:28		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	3/29/11 17:28	
Dibromofluoromethane	100	89-119	3/29/11 17:28	
Toluene-d8	101	87-121	3/29/11 17:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003E-052.5-20110322
 Lab Code: R1101575-010

Service Request: R1101575
 Date Collected: 3/22/11 1552
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	3/28/11 17:45		240184	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	3/28/11 17:45		240184	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	3/28/11 17:45		240184	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	3/28/11 17:45		240184	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	3/28/11 17:45		240184	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	3/28/11 17:45		240184	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	3/28/11 17:45		240184	
n-Butanol	50	U	50	6.7	1	NA	3/28/11 17:45		240184	
2-Butanone (MEK)	10	U	10	1.0	1	NA	3/28/11 17:45		240184	
2-Hexanone	10	U	10	0.40	1	NA	3/28/11 17:45		240184	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	3/28/11 17:45		240184	
Acetone	20	U	20	1.6	1	NA	3/28/11 17:45		240184	
Benzene	5.0	U	5.0	0.31	1	NA	3/28/11 17:45		240184	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	3/28/11 17:45		240184	
Bromoform	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Bromomethane	5.0	U	5.0	0.40	1	NA	3/28/11 17:45		240184	
Carbon Disulfide	10	U	10	0.35	1	NA	3/28/11 17:45		240184	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	3/28/11 17:45		240184	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Chloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Chloroform	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Chloromethane	5.0	U	5.0	0.46	1	NA	3/28/11 17:45		240184	
Cyclohexane	10	U	10	0.30	1	NA	3/28/11 17:45		240184	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	3/28/11 17:45		240184	
Dichloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	3/28/11 17:45		240184	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	3/28/11 17:45		240184	
Methyl Acetate	10	U	10	0.66	1	NA	3/28/11 17:45		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110322
Lab Code: R1101575-010

Service Request: R1101575
Date Collected: 3/22/11 1552
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Methylcyclohexane	10	U	10	0.30	1	NA	3/28/11 17:45		240184	
Styrene	5.0	U	5.0	0.35	1	NA	3/28/11 17:45		240184	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	3/28/11 17:45		240184	
Toluene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
cis-1,2-Dichloroethene	0.62	J	5.0	0.30	1	NA	3/28/11 17:45		240184	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	3/28/11 17:45		240184	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
o-Xylene	5.0	U	5.0	0.40	1	NA	3/28/11 17:45		240184	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/28/11 17:45		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	3/28/11 17:45	
Dibromofluoromethane	107	89-119	3/28/11 17:45	
Toluene-d8	106	87-121	3/28/11 17:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110322-01
 Lab Code: R1101575-011

Service Request: R1101575
 Date Collected: 3/22/11
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,1,2-Trichloroethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	1	NA	3/28/11 18:13		240184	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	1	NA	3/28/11 18:13		240184	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	1	NA	3/28/11 18:13		240184	
1,2-Dibromoethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,2-Dichlorobenzene	5.0 U	5.0	0.40	1	NA	3/28/11 18:13		240184	
1,2-Dichloroethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
1,2-Dichloropropane	5.0 U	5.0	0.66	1	NA	3/28/11 18:13		240184	
1,3-Dichlorobenzene	5.0 U	5.0	0.36	1	NA	3/28/11 18:13		240184	
1,4-Dichlorobenzene	5.0 U	5.0	0.34	1	NA	3/28/11 18:13		240184	
n-Butanol	50 U	50	6.7	1	NA	3/28/11 18:13		240184	
2-Butanone (MEK)	10 U	10	1.0	1	NA	3/28/11 18:13		240184	
2-Hexanone	10 U	10	0.40	1	NA	3/28/11 18:13		240184	
4-Methyl-2-pentanone	10 U	10	0.34	1	NA	3/28/11 18:13		240184	
Acetone	20 U	20	1.6	1	NA	3/28/11 18:13		240184	
Benzene	5.0 U	5.0	0.31	1	NA	3/28/11 18:13		240184	
Bromodichloromethane	5.0 U	5.0	0.41	1	NA	3/28/11 18:13		240184	
Bromoform	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Bromomethane	5.0 U	5.0	0.40	1	NA	3/28/11 18:13		240184	
Carbon Disulfide	10 U	10	0.35	1	NA	3/28/11 18:13		240184	
Carbon Tetrachloride	5.0 U	5.0	0.36	1	NA	3/28/11 18:13		240184	
Chlorobenzene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Chloroethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Chloroform	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Chloromethane	5.0 U	5.0	0.46	1	NA	3/28/11 18:13		240184	
Cyclohexane	10 U	10	0.30	1	NA	3/28/11 18:13		240184	
Dibromochloromethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	1	NA	3/28/11 18:13		240184	
Dichloromethane	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Ethylbenzene	5.0 U	5.0	0.42	1	NA	3/28/11 18:13		240184	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	1	NA	3/28/11 18:13		240184	
Methyl Acetate	10 U	10	0.66	1	NA	3/28/11 18:13		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110322-01
 Lab Code: R1101575-011

Service Request: R1101575
 Date Collected: 3/22/11
 Date Received: 3/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Methylcyclohexane	10 U	10	0.30	1	NA	3/28/11 18:13		240184	
Styrene	5.0 U	5.0	0.35	1	NA	3/28/11 18:13		240184	
Tetrachloroethene (PCE)	5.0 U	5.0	0.42	1	NA	3/28/11 18:13		240184	
Toluene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Trichloroethene (TCE)	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
Vinyl Chloride	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
cis-1,2-Dichloroethene	1.5 J	5.0	0.30	1	NA	3/28/11 18:13		240184	
cis-1,3-Dichloropropene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
m,p-Xylenes	5.0 U	5.0	0.81	1	NA	3/28/11 18:13		240184	
n-Butyl Acetate	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
o-Xylene	5.0 U	5.0	0.40	1	NA	3/28/11 18:13		240184	
trans-1,2-Dichloroethene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	
trans-1,3-Dichloropropene	5.0 U	5.0	0.30	1	NA	3/28/11 18:13		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	3/28/11 18:13	
Dibromofluoromethane	102	89-119	3/28/11 18:13	
Toluene-d8	100	87-121	3/28/11 18:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110322-01
Lab Code: R1101575-012

Service Request: R1101575
Date Collected: 3/22/11
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	3/28/11 18:40		240184	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	3/28/11 18:40		240184	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	3/28/11 18:40		240184	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	3/28/11 18:40		240184	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	3/28/11 18:40		240184	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	3/28/11 18:40		240184	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	3/28/11 18:40		240184	
n-Butanol	50	U	50	6.7	1	NA	3/28/11 18:40		240184	
2-Butanone (MEK)	10	U	10	1.0	1	NA	3/28/11 18:40		240184	
2-Hexanone	10	U	10	0.40	1	NA	3/28/11 18:40		240184	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	3/28/11 18:40		240184	
Acetone	20	U	20	1.6	1	NA	3/28/11 18:40		240184	
Benzene	5.0	U	5.0	0.31	1	NA	3/28/11 18:40		240184	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	3/28/11 18:40		240184	
Bromoform	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Bromomethane	5.0	U	5.0	0.40	1	NA	3/28/11 18:40		240184	
Carbon Disulfide	10	U	10	0.35	1	NA	3/28/11 18:40		240184	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	3/28/11 18:40		240184	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Chloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Chloroform	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Chloromethane	5.0	U	5.0	0.46	1	NA	3/28/11 18:40		240184	
Cyclohexane	10	U	10	0.30	1	NA	3/28/11 18:40		240184	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	3/28/11 18:40		240184	
Dichloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	3/28/11 18:40		240184	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	3/28/11 18:40		240184	
Methyl Acetate	10	U	10	0.66	1	NA	3/28/11 18:40		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110322-01
Lab Code: R1101575-012

Service Request: R1101575
Date Collected: 3/22/11
Date Received: 3/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Methylcyclohexane	10 U	10	0.30	1	NA	3/28/11 18:40		240184	
Styrene	5.0 U	5.0	0.35	1	NA	3/28/11 18:40		240184	
Tetrachloroethene (PCE)	5.0 U	5.0	0.42	1	NA	3/28/11 18:40		240184	
Toluene	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Trichloroethene (TCE)	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
Vinyl Chloride	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
cis-1,2-Dichloroethene	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
cis-1,3-Dichloropropene	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
m,p-Xylenes	5.0 U	5.0	0.81	1	NA	3/28/11 18:40		240184	
n-Butyl Acetate	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
o-Xylene	5.0 U	5.0	0.40	1	NA	3/28/11 18:40		240184	
trans-1,2-Dichloroethene	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	
trans-1,3-Dichloropropene	5.0 U	5.0	0.30	1	NA	3/28/11 18:40		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	3/28/11 18:40	
Dibromofluoromethane	106	89-119	3/28/11 18:40	
Toluene-d8	105	87-121	3/28/11 18:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110328
Lab Code: R1101575-013

Service Request: R1101575
Date Collected: 3/28/11 0926
Date Received: 3/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	227		mg/L	2.0	1	NA	4/7/11 11:10	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	3/30/11 15:37	
Carbon, Total Organic (TOC), Average	9060	4.9		mg/L	1.0	1	NA	3/31/11 17:20	
Chloride	300.0	664		mg/L	40	200	NA	3/30/11 23:48	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	4/7/11 14:31	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	3/30/11 15:37	*
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	3/31/11 13:12	*
Sulfate	300.0	59.0		mg/L	2.0	10	NA	3/30/11 15:37	
Sulfide, Total	SM 4500-S2- F	1.1		mg/L	1.0	1	NA	4/1/11 13:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110328
 Lab Code: R1101575-013

Service Request: R1101575
 Date Collected: 3/28/11 0926
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,1,2,2-Tetrachloroethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,1,2-Trichloroethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,1,2-Trichloro-1,2,2-trifluoroethane	8200	1000	80	200	NA	3/31/11 21:56		240878	
1,1-Dichloroethane (1,1-DCA)	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,1-Dichloroethene (1,1-DCE)	1000 U	1000	74	200	NA	3/31/11 21:56		240878	
1,2,4-Trichlorobenzene	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,2-Dibromo-3-chloropropane (DBCP)	1000 U	1000	86	200	NA	3/31/11 21:56		240878	
1,2-Dibromoethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,2-Dichlorobenzene	1000 U	1000	80	200	NA	3/31/11 21:56		240878	
1,2-Dichloroethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
1,2-Dichloropropane	1000 U	1000	140	200	NA	3/31/11 21:56		240878	
1,3-Dichlorobenzene	1000 U	1000	72	200	NA	3/31/11 21:56		240878	
1,4-Dichlorobenzene	1000 U	1000	68	200	NA	3/31/11 21:56		240878	
n-Butanol	10000 U	10000	1400	200	NA	3/31/11 21:56		240878	
2-Butanone (MEK)	2000 U	2000	200	200	NA	3/31/11 21:56		240878	
2-Hexanone	2000 U	2000	80	200	NA	3/31/11 21:56		240878	
4-Methyl-2-pentanone	2000 U	2000	68	200	NA	3/31/11 21:56		240878	
Acetone	340 J	4000	320	200	NA	3/31/11 21:56		240878	
Benzene	1000 U	1000	62	200	NA	3/31/11 21:56		240878	
Bromodichloromethane	1000 U	1000	82	200	NA	3/31/11 21:56		240878	
Bromoform	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
Bromomethane	1000 U	1000	80	200	NA	3/31/11 21:56		240878	
Carbon Disulfide	2000 U	2000	70	200	NA	3/31/11 21:56		240878	
Carbon Tetrachloride	1000 U	1000	72	200	NA	3/31/11 21:56		240878	
Chlorobenzene	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
Chloroethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
Chloroform	220 J	1000	60	200	NA	3/31/11 21:56		240878	
Chloromethane	1000 U	1000	92	200	NA	3/31/11 21:56		240878	
Cyclohexane	2000 U	2000	60	200	NA	3/31/11 21:56		240878	
Dibromochloromethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
Dichlorodifluoromethane (CFC 12)	1000 U	1000	150	200	NA	3/31/11 21:56		240878	
Dichloromethane	1000 U	1000	60	200	NA	3/31/11 21:56		240878	
Ethylbenzene	1000 U	1000	84	200	NA	3/31/11 21:56		240878	
Isopropylbenzene (Cumene)	1000 U	1000	68	200	NA	3/31/11 21:56		240878	
Methyl Acetate	2000 U	2000	140	200	NA	3/31/11 21:56		240878	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110328
Lab Code: R1101575-013

Service Request: R1101575
Date Collected: 3/28/11 0926
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	3/31/11 21:56		240878	
Methylcyclohexane	2000	U	2000	60	200	NA	3/31/11 21:56		240878	
Styrene	1000	U	1000	70	200	NA	3/31/11 21:56		240878	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	3/31/11 21:56		240878	
Toluene	60	J	1000	60	200	NA	3/31/11 21:56		240878	
Trichloroethene (TCE)	17000		1000	60	200	NA	3/31/11 21:56		240878	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	3/31/11 21:56		240878	
Vinyl Chloride	740	J	1000	60	200	NA	3/31/11 21:56		240878	
cis-1,2-Dichloroethene	31000		1000	60	200	NA	3/31/11 21:56		240878	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	3/31/11 21:56		240878	
m,p-Xylenes	1000	U	1000	170	200	NA	3/31/11 21:56		240878	
n-Butyl Acetate	1000	U	1000	60	200	NA	3/31/11 21:56		240878	
o-Xylene	1000	U	1000	80	200	NA	3/31/11 21:56		240878	
trans-1,2-Dichloroethene	200	J	1000	60	200	NA	3/31/11 21:56		240878	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	3/31/11 21:56		240878	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	3/31/11 21:56	
Dibromofluoromethane	104	89-119	3/31/11 21:56	
Toluene-d8	103	87-121	3/31/11 21:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/28/11 0926
Date Received: 3/30/11
Date Analyzed: 4/7/11 11:04

Sample Name: LC34-RW0007-038.5-20110328
Lab Code: R1101575-013

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star155.run

Analysis Lot: 241604
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	80	1.0	
74-85-1	Ethene	8.6	1.0	
74-82-8	Methane	40	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/28/11 0926
Date Received: 3/30/11
Date Analyzed: 4/7/11 14:10

Sample Name: LC34-RW0007-038.5-20110328
Lab Code: R1101575-013

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\040711\X0005647.D\

Analysis Lot: 240805
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20110329
 Lab Code: R1101575-014

Service Request: R1101575
 Date Collected: 3/29/11 12:13
 Date Received: 3/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,1,2,2-Tetrachloroethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,1,2-Trichloroethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,1,2-Trichloro-1,2,2-trifluoroethane	61000 D	5000	400	1000	NA	4/3/11 23:44		241118	
1,1-Dichloroethane (1,1-DCA)	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,1-Dichloroethene (1,1-DCE)	250 U	250	19	50	NA	3/31/11 22:27		240878	
1,2,4-Trichlorobenzene	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	22	50	NA	3/31/11 22:27		240878	
1,2-Dibromoethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,2-Dichlorobenzene	250 U	250	20	50	NA	3/31/11 22:27		240878	
1,2-Dichloroethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
1,2-Dichloropropane	250 U	250	33	50	NA	3/31/11 22:27		240878	
1,3-Dichlorobenzene	250 U	250	18	50	NA	3/31/11 22:27		240878	
1,4-Dichlorobenzene	250 U	250	17	50	NA	3/31/11 22:27		240878	
n-Butanol	2500 U	2500	340	50	NA	3/31/11 22:27		240878	
2-Butanone (MEK)	500 U	500	50	50	NA	3/31/11 22:27		240878	
2-Hexanone	500 U	500	20	50	NA	3/31/11 22:27		240878	
4-Methyl-2-pentanone	500 U	500	17	50	NA	3/31/11 22:27		240878	
Acetone	1000 U	1000	80	50	NA	3/31/11 22:27		240878	
Benzene	250 U	250	16	50	NA	3/31/11 22:27		240878	
Bromodichloromethane	250 U	250	21	50	NA	3/31/11 22:27		240878	
Bromoform	250 U	250	15	50	NA	3/31/11 22:27		240878	
Bromomethane	250 U	250	20	50	NA	3/31/11 22:27		240878	
Carbon Disulfide	500 U	500	18	50	NA	3/31/11 22:27		240878	
Carbon Tetrachloride	250 U	250	18	50	NA	3/31/11 22:27		240878	
Chlorobenzene	250 U	250	15	50	NA	3/31/11 22:27		240878	
Chloroethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
Chloroform	250 U	250	15	50	NA	3/31/11 22:27		240878	
Chloromethane	250 U	250	23	50	NA	3/31/11 22:27		240878	
Cyclohexane	500 U	500	15	50	NA	3/31/11 22:27		240878	
Dibromochloromethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
Dichlorodifluoromethane (CFC 12)	250 U	250	37	50	NA	3/31/11 22:27		240878	
Dichloromethane	250 U	250	15	50	NA	3/31/11 22:27		240878	
Ethylbenzene	250 U	250	21	50	NA	3/31/11 22:27		240878	
Isopropylbenzene (Cumene)	250 U	250	17	50	NA	3/31/11 22:27		240878	
Methyl Acetate	500 U	500	33	50	NA	3/31/11 22:27		240878	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110329
Lab Code: R1101575-014

Service Request: R1101575
Date Collected: 3/29/11 1213
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	3/31/11 22:27		240878	
Methylcyclohexane	500	U	500	15	50	NA	3/31/11 22:27		240878	
Styrene	250	U	250	18	50	NA	3/31/11 22:27		240878	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	3/31/11 22:27		240878	
Toluene	250	U	250	15	50	NA	3/31/11 22:27		240878	
Trichloroethene (TCE)	110	J	250	15	50	NA	3/31/11 22:27		240878	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	3/31/11 22:27		240878	
Vinyl Chloride	980		250	15	50	NA	3/31/11 22:27		240878	
cis-1,2-Dichloroethene	23000	D	5000	300	1000	NA	4/3/11 23:44		241118	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	3/31/11 22:27		240878	
m,p-Xylenes	250	U	250	41	50	NA	3/31/11 22:27		240878	
n-Butyl Acetate	250	U	250	15	50	NA	3/31/11 22:27		240878	
o-Xylene	250	U	250	20	50	NA	3/31/11 22:27		240878	
trans-1,2-Dichloroethene	500		250	15	50	NA	3/31/11 22:27		240878	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	3/31/11 22:27		240878	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	3/31/11 22:27	
Dibromofluoromethane	104	89-119	3/31/11 22:27	
Toluene-d8	104	87-121	3/31/11 22:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D-037.5-20110328
 Lab Code: R1101575-015

Service Request: R1101575
 Date Collected: 3/28/11 1122
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,1,2,2-Tetrachloroethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,1,2-Trichloroethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		1000	80	200	NA	4/1/11 17:58		241040	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	200	NA	4/1/11 17:58		241040	
1,2,4-Trichlorobenzene	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	200	NA	4/1/11 17:58		241040	
1,2-Dibromoethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,2-Dichlorobenzene	1000	U	1000	80	200	NA	4/1/11 17:58		241040	
1,2-Dichloroethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
1,2-Dichloropropane	1000	U	1000	140	200	NA	4/1/11 17:58		241040	
1,3-Dichlorobenzene	1000	U	1000	72	200	NA	4/1/11 17:58		241040	
1,4-Dichlorobenzene	1000	U	1000	68	200	NA	4/1/11 17:58		241040	
n-Butanol	10000	U	10000	1400	200	NA	4/1/11 17:58		241040	
2-Butanone (MEK)	2000	U	2000	200	200	NA	4/1/11 17:58		241040	
2-Hexanone	2000	U	2000	80	200	NA	4/1/11 17:58		241040	
4-Methyl-2-pentanone	2000	U	2000	68	200	NA	4/1/11 17:58		241040	
Acetone	4000	U	4000	320	200	NA	4/1/11 17:58		241040	
Benzene	1000	U	1000	62	200	NA	4/1/11 17:58		241040	
Bromodichloromethane	1000	U	1000	82	200	NA	4/1/11 17:58		241040	
Bromoform	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Bromomethane	1000	U	1000	80	200	NA	4/1/11 17:58		241040	
Carbon Disulfide	2000	U	2000	70	200	NA	4/1/11 17:58		241040	
Carbon Tetrachloride	1000	U	1000	72	200	NA	4/1/11 17:58		241040	
Chlorobenzene	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Chloroethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Chloroform	180	J	1000	60	200	NA	4/1/11 17:58		241040	
Chloromethane	1000	U	1000	92	200	NA	4/1/11 17:58		241040	
Cyclohexane	2000	U	2000	60	200	NA	4/1/11 17:58		241040	
Dibromochloromethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	200	NA	4/1/11 17:58		241040	
Dichloromethane	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Ethylbenzene	1000	U	1000	84	200	NA	4/1/11 17:58		241040	
Isopropylbenzene (Cumene)	1000	U	1000	68	200	NA	4/1/11 17:58		241040	
Methyl Acetate	2000	U	2000	140	200	NA	4/1/11 17:58		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110328
Lab Code: R1101575-015

Service Request: R1101575
Date Collected: 3/28/11 1122
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Methylcyclohexane	2000	U	2000	60	200	NA	4/1/11 17:58		241040	
Styrene	1000	U	1000	70	200	NA	4/1/11 17:58		241040	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	4/1/11 17:58		241040	
Toluene	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Trichloroethene (TCE)	1600		1000	60	200	NA	4/1/11 17:58		241040	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
Vinyl Chloride	1900		1000	60	200	NA	4/1/11 17:58		241040	
cis-1,2-Dichloroethene	28000		1000	60	200	NA	4/1/11 17:58		241040	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
m,p-Xylenes	1000	U	1000	170	200	NA	4/1/11 17:58		241040	
n-Butyl Acetate	1000	U	1000	60	200	NA	4/1/11 17:58		241040	
o-Xylene	1000	U	1000	80	200	NA	4/1/11 17:58		241040	
trans-1,2-Dichloroethene	320	J	1000	60	200	NA	4/1/11 17:58		241040	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 17:58		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	4/1/11 17:58	
Dibromofluoromethane	102	89-119	4/1/11 17:58	
Toluene-d8	105	87-121	4/1/11 17:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001C-038.5-20110329
 Lab Code: R1101575-016

Service Request: R1101575
 Date Collected: 3/29/11 1114
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,1,2,2-Tetrachloroethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,1,2-Trichloroethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	60000	D	2500	200	500	NA	4/4/11 00:14		241118	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	200	NA	4/1/11 18:28		241040	
1,2,4-Trichlorobenzene	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	200	NA	4/1/11 18:28		241040	
1,2-Dibromoethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,2-Dichlorobenzene	1000	U	1000	80	200	NA	4/1/11 18:28		241040	
1,2-Dichloroethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
1,2-Dichloropropane	1000	U	1000	140	200	NA	4/1/11 18:28		241040	
1,3-Dichlorobenzene	1000	U	1000	72	200	NA	4/1/11 18:28		241040	
1,4-Dichlorobenzene	1000	U	1000	68	200	NA	4/1/11 18:28		241040	
n-Butanol	10000	U	10000	1400	200	NA	4/1/11 18:28		241040	
2-Butanone (MEK)	2000	U	2000	200	200	NA	4/1/11 18:28		241040	
2-Hexanone	2000	U	2000	80	200	NA	4/1/11 18:28		241040	
4-Methyl-2-pentanone	2000	U	2000	68	200	NA	4/1/11 18:28		241040	
Acetone	4000	U	4000	320	200	NA	4/1/11 18:28		241040	
Benzene	1000	U	1000	62	200	NA	4/1/11 18:28		241040	
Bromodichloromethane	1000	U	1000	82	200	NA	4/1/11 18:28		241040	
Bromoform	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Bromomethane	1000	U	1000	80	200	NA	4/1/11 18:28		241040	
Carbon Disulfide	2000	U	2000	70	200	NA	4/1/11 18:28		241040	
Carbon Tetrachloride	1000	U	1000	72	200	NA	4/1/11 18:28		241040	
Chlorobenzene	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Chloroethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Chloroform	160	J	1000	60	200	NA	4/1/11 18:28		241040	
Chloromethane	1000	U	1000	92	200	NA	4/1/11 18:28		241040	
Cyclohexane	2000	U	2000	60	200	NA	4/1/11 18:28		241040	
Dibromochloromethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	200	NA	4/1/11 18:28		241040	
Dichloromethane	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Ethylbenzene	1000	U	1000	84	200	NA	4/1/11 18:28		241040	
Isopropylbenzene (Cumene)	1000	U	1000	68	200	NA	4/1/11 18:28		241040	
Methyl Acetate	2000	U	2000	140	200	NA	4/1/11 18:28		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110329
Lab Code: R1101575-016

Service Request: R1101575
Date Collected: 3/29/11 1114
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Methylcyclohexane	2000	U	2000	60	200	NA	4/1/11 18:28		241040	
Styrene	1000	U	1000	70	200	NA	4/1/11 18:28		241040	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	4/1/11 18:28		241040	
Toluene	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Trichloroethene (TCE)	46000	E	1000	60	200	NA	4/1/11 18:28		241040	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
Vinyl Chloride	380	J	1000	60	200	NA	4/1/11 18:28		241040	
cis-1,2-Dichloroethene	26000	D	2500	150	500	NA	4/4/11 00:14		241118	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
m,p-Xylenes	1000	U	1000	170	200	NA	4/1/11 18:28		241040	
n-Butyl Acetate	1000	U	1000	60	200	NA	4/1/11 18:28		241040	
o-Xylene	1000	U	1000	80	200	NA	4/1/11 18:28		241040	
trans-1,2-Dichloroethene	290	J	1000	60	200	NA	4/1/11 18:28		241040	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 18:28		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	4/1/11 18:28	
Dibromofluoromethane	104	89-119	4/1/11 18:28	
Toluene-d8	104	87-121	4/1/11 18:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110329
Lab Code: R1101575-017

Service Request: R1101575
Date Collected: 3/29/11 0951
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	200	500	NA	4/4/11 00:44		241118	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/4/11 00:44		241118	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/4/11 00:44		241118	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/4/11 00:44		241118	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/4/11 00:44		241118	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/4/11 00:44		241118	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/4/11 00:44		241118	
n-Butanol	25000	U	25000	3400	500	NA	4/4/11 00:44		241118	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/4/11 00:44		241118	
2-Hexanone	5000	U	5000	200	500	NA	4/4/11 00:44		241118	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/4/11 00:44		241118	
Acetone	10000	U	10000	800	500	NA	4/4/11 00:44		241118	
Benzene	2500	U	2500	160	500	NA	4/4/11 00:44		241118	
Bromodichloromethane	2500	U	2500	210	500	NA	4/4/11 00:44		241118	
Bromoform	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Bromomethane	2500	U	2500	200	500	NA	4/4/11 00:44		241118	
Carbon Disulfide	5000	U	5000	180	500	NA	4/4/11 00:44		241118	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/4/11 00:44		241118	
Chlorobenzene	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Chloroethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Chloroform	490	J	2500	150	500	NA	4/4/11 00:44		241118	
Chloromethane	2500	U	2500	230	500	NA	4/4/11 00:44		241118	
Cyclohexane	5000	U	5000	150	500	NA	4/4/11 00:44		241118	
Dibromochloromethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/4/11 00:44		241118	
Dichloromethane	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Ethylbenzene	2500	U	2500	210	500	NA	4/4/11 00:44		241118	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/4/11 00:44		241118	
Methyl Acetate	5000	U	5000	330	500	NA	4/4/11 00:44		241118	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002C-038.5-20110329
 Lab Code: R1101575-017

Service Request: R1101575
 Date Collected: 3/29/11 0951
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Methylcyclohexane	5000	U	5000	150	500	NA	4/4/11 00:44		241118	
Styrene	2500	U	2500	180	500	NA	4/4/11 00:44		241118	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/4/11 00:44		241118	
Toluene	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Trichloroethene (TCE)	5300		2500	150	500	NA	4/4/11 00:44		241118	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
Vinyl Chloride	2300	J	2500	150	500	NA	4/4/11 00:44		241118	
cis-1,2-Dichloroethene	75000		2500	150	500	NA	4/4/11 00:44		241118	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
m,p-Xylenes	2500	U	2500	410	500	NA	4/4/11 00:44		241118	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/4/11 00:44		241118	
o-Xylene	2500	U	2500	200	500	NA	4/4/11 00:44		241118	
trans-1,2-Dichloroethene	460	J	2500	150	500	NA	4/4/11 00:44		241118	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/4/11 00:44		241118	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	4/4/11 00:44	
Dibromofluoromethane	101	89-119	4/4/11 00:44	
Toluene-d8	103	87-121	4/4/11 00:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110329
 Lab Code: R1101575-018

Service Request: R1101575
 Date Collected: 3/29/11 1016
 Date Received: 3/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,1,2,2-Tetrachloroethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,1,2-Trichloroethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	40	100	NA	4/1/11 19:29		241040	
1,1-Dichloroethane (1,1-DCA)	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,1-Dichloroethene (1,1-DCE)	500	U	500	37	100	NA	4/1/11 19:29		241040	
1,2,4-Trichlorobenzene	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	100	NA	4/1/11 19:29		241040	
1,2-Dibromoethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,2-Dichlorobenzene	500	U	500	40	100	NA	4/1/11 19:29		241040	
1,2-Dichloroethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
1,2-Dichloropropane	500	U	500	66	100	NA	4/1/11 19:29		241040	
1,3-Dichlorobenzene	500	U	500	36	100	NA	4/1/11 19:29		241040	
1,4-Dichlorobenzene	500	U	500	34	100	NA	4/1/11 19:29		241040	
n-Butanol	5000	U	5000	670	100	NA	4/1/11 19:29		241040	
2-Butanone (MEK)	1000	U	1000	100	100	NA	4/1/11 19:29		241040	
2-Hexanone	1000	U	1000	40	100	NA	4/1/11 19:29		241040	
4-Methyl-2-pentanone	1000	U	1000	34	100	NA	4/1/11 19:29		241040	
Acetone	2000	U	2000	160	100	NA	4/1/11 19:29		241040	
Benzene	500	U	500	31	100	NA	4/1/11 19:29		241040	
Bromodichloromethane	500	U	500	41	100	NA	4/1/11 19:29		241040	
Bromoform	500	U	500	30	100	NA	4/1/11 19:29		241040	
Bromomethane	500	U	500	40	100	NA	4/1/11 19:29		241040	
Carbon Disulfide	1000	U	1000	35	100	NA	4/1/11 19:29		241040	
Carbon Tetrachloride	500	U	500	36	100	NA	4/1/11 19:29		241040	
Chlorobenzene	500	U	500	30	100	NA	4/1/11 19:29		241040	
Chloroethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
Chloroform	72	J	500	30	100	NA	4/1/11 19:29		241040	
Chloromethane	500	U	500	46	100	NA	4/1/11 19:29		241040	
Cyclohexane	1000	U	1000	30	100	NA	4/1/11 19:29		241040	
Dibromochloromethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
Dichlorodifluoromethane (CFC 12)	500	U	500	73	100	NA	4/1/11 19:29		241040	
Dichloromethane	500	U	500	30	100	NA	4/1/11 19:29		241040	
Ethylbenzene	500	U	500	42	100	NA	4/1/11 19:29		241040	
Isopropylbenzene (Cumene)	500	U	500	34	100	NA	4/1/11 19:29		241040	
Methyl Acetate	1000	U	1000	66	100	NA	4/1/11 19:29		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110329
Lab Code: R1101575-018

Service Request: R1101575
Date Collected: 3/29/11 1016
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	30	100	NA	4/1/11 19:29		241040	
Methylcyclohexane	1000	U	1000	30	100	NA	4/1/11 19:29		241040	
Styrene	500	U	500	35	100	NA	4/1/11 19:29		241040	
Tetrachloroethene (PCE)	500	U	500	42	100	NA	4/1/11 19:29		241040	
Toluene	500	U	500	30	100	NA	4/1/11 19:29		241040	
Trichloroethene (TCE)	36	J	500	30	100	NA	4/1/11 19:29		241040	
Trichlorofluoromethane (CFC 11)	500	U	500	30	100	NA	4/1/11 19:29		241040	
Vinyl Chloride	3500		500	30	100	NA	4/1/11 19:29		241040	
cis-1,2-Dichloroethene	12000		500	30	100	NA	4/1/11 19:29		241040	
cis-1,3-Dichloropropene	500	U	500	30	100	NA	4/1/11 19:29		241040	
m,p-Xylenes	500	U	500	81	100	NA	4/1/11 19:29		241040	
n-Butyl Acetate	500	U	500	30	100	NA	4/1/11 19:29		241040	
o-Xylene	500	U	500	40	100	NA	4/1/11 19:29		241040	
trans-1,2-Dichloroethene	160	J	500	30	100	NA	4/1/11 19:29		241040	
trans-1,3-Dichloropropene	500	U	500	30	100	NA	4/1/11 19:29		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	4/1/11 19:29	
Dibromofluoromethane	106	89-119	4/1/11 19:29	
Toluene-d8	105	87-121	4/1/11 19:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110328
Lab Code: R1101575-019

Service Request: R1101575
Date Collected: 3/28/11 1019
Date Received: 3/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	168		mg/L	2.0	1	NA	4/7/11 11:10	
Bromide	300.0	1.8		mg/L	1.0	10	NA	3/30/11 15:50	
Carbon, Total Organic (TOC), Average	9060	3.5		mg/L	1.0	1	NA	3/31/11 17:55	
Chloride	300.0	665		mg/L	20	100	NA	3/31/11 00:01	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	4/7/11 14:42	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	3/30/11 15:50	*
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	3/31/11 00:01	*
Sulfate	300.0	91.3		mg/L	2.0	10	NA	3/30/11 15:50	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/1/11 13:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110328
 Lab Code: R1101575-019

Service Request: R1101575
 Date Collected: 3/28/11 1019
 Date Received: 3/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,1,2,2-Tetrachloroethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,1,2-Trichloroethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,1,2-Trichloro-1,2,2-trifluoroethane	130	25	2.0	5	NA	4/4/11 01:14		241118	
1,1-Dichloroethane (1,1-DCA)	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,1-Dichloroethene (1,1-DCE)	25 U	25	1.9	5	NA	4/4/11 01:14		241118	
1,2,4-Trichlorobenzene	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,2-Dibromo-3-chloropropane (DBCP)	25 U	25	2.2	5	NA	4/4/11 01:14		241118	
1,2-Dibromoethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,2-Dichlorobenzene	25 U	25	2.0	5	NA	4/4/11 01:14		241118	
1,2-Dichloroethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
1,2-Dichloropropane	25 U	25	3.4	5	NA	4/4/11 01:14		241118	
1,3-Dichlorobenzene	25 U	25	1.8	5	NA	4/4/11 01:14		241118	
1,4-Dichlorobenzene	25 U	25	1.8	5	NA	4/4/11 01:14		241118	
n-Butanol	250 U	250	34	5	NA	4/4/11 01:14		241118	
2-Butanone (MEK)	50 U	50	5.0	5	NA	4/4/11 01:14		241118	
2-Hexanone	50 U	50	2.0	5	NA	4/4/11 01:14		241118	
4-Methyl-2-pentanone	50 U	50	1.8	5	NA	4/4/11 01:14		241118	
Acetone	100 U	100	8.0	5	NA	4/4/11 01:14		241118	
Benzene	25 U	25	1.6	5	NA	4/4/11 01:14		241118	
Bromodichloromethane	25 U	25	2.1	5	NA	4/4/11 01:14		241118	
Bromoform	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Bromomethane	25 U	25	2.0	5	NA	4/4/11 01:14		241118	
Carbon Disulfide	50 U	50	1.8	5	NA	4/4/11 01:14		241118	
Carbon Tetrachloride	25 U	25	1.8	5	NA	4/4/11 01:14		241118	
Chlorobenzene	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Chloroethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Chloroform	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Chloromethane	25 U	25	2.4	5	NA	4/4/11 01:14		241118	
Cyclohexane	50 U	50	1.5	5	NA	4/4/11 01:14		241118	
Dibromochloromethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Dichlorodifluoromethane (CFC 12)	25 U	25	3.7	5	NA	4/4/11 01:14		241118	
Dichloromethane	25 U	25	1.5	5	NA	4/4/11 01:14		241118	
Ethylbenzene	25 U	25	2.1	5	NA	4/4/11 01:14		241118	
Isopropylbenzene (Cumene)	25 U	25	1.8	5	NA	4/4/11 01:14		241118	
Methyl Acetate	50 U	50	3.4	5	NA	4/4/11 01:14		241118	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110328
Lab Code: R1101575-019

Service Request: R1101575
Date Collected: 3/28/11 1019
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.5	5	NA	4/4/11 01:14		241118	
Methylcyclohexane	50	U	50	1.5	5	NA	4/4/11 01:14		241118	
Styrene	25	U	25	1.8	5	NA	4/4/11 01:14		241118	
Tetrachloroethene (PCE)	25	U	25	2.1	5	NA	4/4/11 01:14		241118	
Toluene	25	U	25	1.5	5	NA	4/4/11 01:14		241118	
Trichloroethene (TCE)	840		25	1.5	5	NA	4/4/11 01:14		241118	
Trichlorofluoromethane (CFC 11)	25	U	25	1.5	5	NA	4/4/11 01:14		241118	
Vinyl Chloride	14	J	25	1.5	5	NA	4/4/11 01:14		241118	
cis-1,2-Dichloroethene	280		25	1.5	5	NA	4/4/11 01:14		241118	
cis-1,3-Dichloropropene	25	U	25	1.5	5	NA	4/4/11 01:14		241118	
m,p-Xylenes	25	U	25	4.1	5	NA	4/4/11 01:14		241118	
n-Butyl Acetate	25	U	25	1.5	5	NA	4/4/11 01:14		241118	
o-Xylene	25	U	25	2.0	5	NA	4/4/11 01:14		241118	
trans-1,2-Dichloroethene	1.9	J	25	1.5	5	NA	4/4/11 01:14		241118	
trans-1,3-Dichloropropene	25	U	25	1.5	5	NA	4/4/11 01:14		241118	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	4/4/11 01:14	
Dibromofluoromethane	105	89-119	4/4/11 01:14	
Toluene-d8	105	87-121	4/4/11 01:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/28/11 10:19
Date Received: 3/30/11
Date Analyzed: 4/7/11 11:19

Sample Name: LC34-RW0008-052.0-20110328
Lab Code: R1101575-019

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star156.run

Analysis Lot: 241604
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	3.1	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	7.7	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: 3/28/11 1019
Date Received: 3/30/11
Date Analyzed: 4/8/11 00:33

Sample Name: LC34-RW0008-052.0-20110328
Lab Code: R1101575-019

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\040711\X0005657.D\

Analysis Lot: 240805
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002DI-052.5-20110328
 Lab Code: R1101575-020

Service Request: R1101575
 Date Collected: 3/28/11 1057
 Date Received: 3/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,1,2,2-Tetrachloroethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,1,2-Trichloroethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	J	13	1.0	2.5	NA	4/4/11 01:44		241118	
1,1-Dichloroethane (1,1-DCA)	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,1-Dichloroethene (1,1-DCE)	13	U	13	0.93	2.5	NA	4/4/11 01:44		241118	
1,2,4-Trichlorobenzene	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.1	2.5	NA	4/4/11 01:44		241118	
1,2-Dibromoethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,2-Dichlorobenzene	13	U	13	1.0	2.5	NA	4/4/11 01:44		241118	
1,2-Dichloroethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
1,2-Dichloropropane	13	U	13	1.7	2.5	NA	4/4/11 01:44		241118	
1,3-Dichlorobenzene	13	U	13	0.90	2.5	NA	4/4/11 01:44		241118	
1,4-Dichlorobenzene	13	U	13	0.86	2.5	NA	4/4/11 01:44		241118	
n-Butanol	130	U	130	17	2.5	NA	4/4/11 01:44		241118	
2-Butanone (MEK)	25	U	25	2.5	2.5	NA	4/4/11 01:44		241118	
2-Hexanone	25	U	25	1.0	2.5	NA	4/4/11 01:44		241118	
4-Methyl-2-pentanone	25	U	25	0.86	2.5	NA	4/4/11 01:44		241118	
Acetone	50	U	50	4.0	2.5	NA	4/4/11 01:44		241118	
Benzene	13	U	13	0.78	2.5	NA	4/4/11 01:44		241118	
Bromodichloromethane	13	U	13	1.1	2.5	NA	4/4/11 01:44		241118	
Bromoform	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Bromomethane	13	U	13	1.0	2.5	NA	4/4/11 01:44		241118	
Carbon Disulfide	25	U	25	0.88	2.5	NA	4/4/11 01:44		241118	
Carbon Tetrachloride	13	U	13	0.90	2.5	NA	4/4/11 01:44		241118	
Chlorobenzene	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Chloroethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Chloroform	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Chloromethane	13	U	13	1.2	2.5	NA	4/4/11 01:44		241118	
Cyclohexane	25	U	25	0.75	2.5	NA	4/4/11 01:44		241118	
Dibromochloromethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Dichlorodifluoromethane (CFC 12)	13	U	13	1.9	2.5	NA	4/4/11 01:44		241118	
Dichloromethane	13	U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Ethylbenzene	13	U	13	1.1	2.5	NA	4/4/11 01:44		241118	
Isopropylbenzene (Cumene)	13	U	13	0.86	2.5	NA	4/4/11 01:44		241118	
Methyl Acetate	25	U	25	1.7	2.5	NA	4/4/11 01:44		241118	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002DI-052.5-20110328
Lab Code: R1101575-020

Service Request: R1101575
Date Collected: 3/28/11 1057
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Methylcyclohexane	25 U	25	0.75	2.5	NA	4/4/11 01:44		241118	
Styrene	13 U	13	0.88	2.5	NA	4/4/11 01:44		241118	
Tetrachloroethene (PCE)	13 U	13	1.1	2.5	NA	4/4/11 01:44		241118	
Toluene	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Trichloroethene (TCE)	75	13	0.75	2.5	NA	4/4/11 01:44		241118	
Trichlorofluoromethane (CFC 11)	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	
Vinyl Chloride	1.9 J	13	0.75	2.5	NA	4/4/11 01:44		241118	
cis-1,2-Dichloroethene	350	13	0.75	2.5	NA	4/4/11 01:44		241118	
cis-1,3-Dichloropropene	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	
m,p-Xylenes	13 U	13	2.1	2.5	NA	4/4/11 01:44		241118	
n-Butyl Acetate	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	
o-Xylene	13 U	13	1.0	2.5	NA	4/4/11 01:44		241118	
trans-1,2-Dichloroethene	3.0 J	13	0.75	2.5	NA	4/4/11 01:44		241118	
trans-1,3-Dichloropropene	13 U	13	0.75	2.5	NA	4/4/11 01:44		241118	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	4/4/11 01:44	
Dibromofluoromethane	102	89-119	4/4/11 01:44	
Toluene-d8	105	87-121	4/4/11 01:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20110329
 Lab Code: R1101575-021

Service Request: R1101575
 Date Collected: 3/29/11 1149
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,1,2,2-Tetrachloroethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,1,2-Trichloroethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.5 J	13	1.0	2.5	NA	4/4/11 02:15		241118	
1,1-Dichloroethane (1,1-DCA)	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,1-Dichloroethene (1,1-DCE)	13 U	13	0.93	2.5	NA	4/4/11 02:15		241118	
1,2,4-Trichlorobenzene	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,2-Dibromo-3-chloropropane (DBCP)	13 U	13	1.1	2.5	NA	4/4/11 02:15		241118	
1,2-Dibromoethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,2-Dichlorobenzene	13 U	13	1.0	2.5	NA	4/4/11 02:15		241118	
1,2-Dichloroethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
1,2-Dichloropropane	13 U	13	1.7	2.5	NA	4/4/11 02:15		241118	
1,3-Dichlorobenzene	13 U	13	0.90	2.5	NA	4/4/11 02:15		241118	
1,4-Dichlorobenzene	13 U	13	0.86	2.5	NA	4/4/11 02:15		241118	
n-Butanol	130 U	130	17	2.5	NA	4/4/11 02:15		241118	
2-Butanone (MEK)	25 U	25	2.5	2.5	NA	4/4/11 02:15		241118	
2-Hexanone	25 U	25	1.0	2.5	NA	4/4/11 02:15		241118	
4-Methyl-2-pentanone	25 U	25	0.86	2.5	NA	4/4/11 02:15		241118	
Acetone	50 U	50	4.0	2.5	NA	4/4/11 02:15		241118	
Benzene	13 U	13	0.78	2.5	NA	4/4/11 02:15		241118	
Bromodichloromethane	13 U	13	1.1	2.5	NA	4/4/11 02:15		241118	
Bromoform	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Bromomethane	13 U	13	1.0	2.5	NA	4/4/11 02:15		241118	
Carbon Disulfide	25 U	25	0.88	2.5	NA	4/4/11 02:15		241118	
Carbon Tetrachloride	13 U	13	0.90	2.5	NA	4/4/11 02:15		241118	
Chlorobenzene	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Chloroethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Chloroform	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Chloromethane	13 U	13	1.2	2.5	NA	4/4/11 02:15		241118	
Cyclohexane	25 U	25	0.75	2.5	NA	4/4/11 02:15		241118	
Dibromochloromethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Dichlorodifluoromethane (CFC 12)	13 U	13	1.9	2.5	NA	4/4/11 02:15		241118	
Dichloromethane	13 U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Ethylbenzene	13 U	13	1.1	2.5	NA	4/4/11 02:15		241118	
Isopropylbenzene (Cumene)	13 U	13	0.86	2.5	NA	4/4/11 02:15		241118	
Methyl Acetate	25 U	25	1.7	2.5	NA	4/4/11 02:15		241118	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110329
Lab Code: R1101575-021

Service Request: R1101575
Date Collected: 3/29/11 1149
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Methylcyclohexane	25	U	25	0.75	2.5	NA	4/4/11 02:15		241118	
Styrene	13	U	13	0.88	2.5	NA	4/4/11 02:15		241118	
Tetrachloroethene (PCE)	13	U	13	1.1	2.5	NA	4/4/11 02:15		241118	
Toluene	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Trichloroethene (TCE)	400		13	0.75	2.5	NA	4/4/11 02:15		241118	
Trichlorofluoromethane (CFC 11)	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
Vinyl Chloride	0.83	J	13	0.75	2.5	NA	4/4/11 02:15		241118	
cis-1,2-Dichloroethene	71		13	0.75	2.5	NA	4/4/11 02:15		241118	
cis-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
m,p-Xylenes	13	U	13	2.1	2.5	NA	4/4/11 02:15		241118	
n-Butyl Acetate	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
o-Xylene	13	U	13	1.0	2.5	NA	4/4/11 02:15		241118	
trans-1,2-Dichloroethene	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	
trans-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/4/11 02:15		241118	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	4/4/11 02:15	
Dibromofluoromethane	102	89-119	4/4/11 02:15	
Toluene-d8	102	87-121	4/4/11 02:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003E-052.5-20110329
 Lab Code: R1101575-022

Service Request: R1101575
 Date Collected: 3/29/11 1049
 Date Received: 3/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.74	J	5.0	0.40	1	NA	4/1/11 21:30		241040	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/1/11 21:30		241040	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/1/11 21:30		241040	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/1/11 21:30		241040	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/1/11 21:30		241040	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/1/11 21:30		241040	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/1/11 21:30		241040	
n-Butanol	50	U	50	6.7	1	NA	4/1/11 21:30		241040	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/1/11 21:30		241040	
2-Hexanone	10	U	10	0.40	1	NA	4/1/11 21:30		241040	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/1/11 21:30		241040	
Acetone	20	U	20	1.6	1	NA	4/1/11 21:30		241040	
Benzene	5.0	U	5.0	0.31	1	NA	4/1/11 21:30		241040	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/1/11 21:30		241040	
Bromoform	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/1/11 21:30		241040	
Carbon Disulfide	10	U	10	0.35	1	NA	4/1/11 21:30		241040	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/1/11 21:30		241040	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Chloroform	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/1/11 21:30		241040	
Cyclohexane	10	U	10	0.30	1	NA	4/1/11 21:30		241040	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/1/11 21:30		241040	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/1/11 21:30		241040	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/1/11 21:30		241040	
Methyl Acetate	10	U	10	0.66	1	NA	4/1/11 21:30		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110329
Lab Code: R1101575-022

Service Request: R1101575
Date Collected: 3/29/11 1049
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Methylcyclohexane	10	U	10	0.30	1	NA	4/1/11 21:30		241040	
Styrene	5.0	U	5.0	0.35	1	NA	4/1/11 21:30		241040	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/1/11 21:30		241040	
Toluene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Trichloroethene (TCE)	0.43	J	5.0	0.30	1	NA	4/1/11 21:30		241040	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
cis-1,2-Dichloroethene	1.2	J	5.0	0.30	1	NA	4/1/11 21:30		241040	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/1/11 21:30		241040	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/1/11 21:30		241040	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 21:30		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	4/1/11 21:30	
Dibromofluoromethane	106	89-119	4/1/11 21:30	
Toluene-d8	107	87-121	4/1/11 21:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110328-01
Lab Code: R1101575-023

Service Request: R1101575
Date Collected: 3/28/11
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,1,2,2-Tetrachloroethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,1,2-Trichloroethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	7100		1000	80	200	NA	4/1/11 22:01		241040	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	200	NA	4/1/11 22:01		241040	
1,2,4-Trichlorobenzene	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	200	NA	4/1/11 22:01		241040	
1,2-Dibromoethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,2-Dichlorobenzene	1000	U	1000	80	200	NA	4/1/11 22:01		241040	
1,2-Dichloroethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
1,2-Dichloropropane	1000	U	1000	140	200	NA	4/1/11 22:01		241040	
1,3-Dichlorobenzene	1000	U	1000	72	200	NA	4/1/11 22:01		241040	
1,4-Dichlorobenzene	1000	U	1000	68	200	NA	4/1/11 22:01		241040	
n-Butanol	10000	U	10000	1400	200	NA	4/1/11 22:01		241040	
2-Butanone (MEK)	2000	U	2000	200	200	NA	4/1/11 22:01		241040	
2-Hexanone	2000	U	2000	80	200	NA	4/1/11 22:01		241040	
4-Methyl-2-pentanone	2000	U	2000	68	200	NA	4/1/11 22:01		241040	
Acetone	4000	U	4000	320	200	NA	4/1/11 22:01		241040	
Benzene	1000	U	1000	62	200	NA	4/1/11 22:01		241040	
Bromodichloromethane	1000	U	1000	82	200	NA	4/1/11 22:01		241040	
Bromoform	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Bromomethane	1000	U	1000	80	200	NA	4/1/11 22:01		241040	
Carbon Disulfide	2000	U	2000	70	200	NA	4/1/11 22:01		241040	
Carbon Tetrachloride	1000	U	1000	72	200	NA	4/1/11 22:01		241040	
Chlorobenzene	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Chloroethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Chloroform	210	J	1000	60	200	NA	4/1/11 22:01		241040	
Chloromethane	1000	U	1000	92	200	NA	4/1/11 22:01		241040	
Cyclohexane	2000	U	2000	60	200	NA	4/1/11 22:01		241040	
Dibromochloromethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	200	NA	4/1/11 22:01		241040	
Dichloromethane	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Ethylbenzene	1000	U	1000	84	200	NA	4/1/11 22:01		241040	
Isopropylbenzene (Cumene)	1000	U	1000	68	200	NA	4/1/11 22:01		241040	
Methyl Acetate	2000	U	2000	140	200	NA	4/1/11 22:01		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110328-01
Lab Code: R1101575-023

Service Request: R1101575
Date Collected: 3/28/11
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Methylcyclohexane	2000	U	2000	60	200	NA	4/1/11 22:01		241040	
Styrene	1000	U	1000	70	200	NA	4/1/11 22:01		241040	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	4/1/11 22:01		241040	
Toluene	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Trichloroethene (TCE)	16000		1000	60	200	NA	4/1/11 22:01		241040	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
Vinyl Chloride	810	J	1000	60	200	NA	4/1/11 22:01		241040	
cis-1,2-Dichloroethene	32000		1000	60	200	NA	4/1/11 22:01		241040	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
m,p-Xylenes	1000	U	1000	170	200	NA	4/1/11 22:01		241040	
n-Butyl Acetate	1000	U	1000	60	200	NA	4/1/11 22:01		241040	
o-Xylene	1000	U	1000	80	200	NA	4/1/11 22:01		241040	
trans-1,2-Dichloroethene	200	J	1000	60	200	NA	4/1/11 22:01		241040	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/1/11 22:01		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	4/1/11 22:01	
Dibromofluoromethane	105	89-119	4/1/11 22:01	
Toluene-d8	107	87-121	4/1/11 22:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110329-01
 Lab Code: R1101575-024

Service Request: R1101575
 Date Collected: 3/29/11
 Date Received: 3/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,1,2-Trichloroethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	1	NA	4/1/11 22:31		241040	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	1	NA	4/1/11 22:31		241040	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	1	NA	4/1/11 22:31		241040	
1,2-Dibromoethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,2-Dichlorobenzene	5.0 U	5.0	0.40	1	NA	4/1/11 22:31		241040	
1,2-Dichloroethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
1,2-Dichloropropane	5.0 U	5.0	0.66	1	NA	4/1/11 22:31		241040	
1,3-Dichlorobenzene	5.0 U	5.0	0.36	1	NA	4/1/11 22:31		241040	
1,4-Dichlorobenzene	5.0 U	5.0	0.34	1	NA	4/1/11 22:31		241040	
n-Butanol	50 U	50	6.7	1	NA	4/1/11 22:31		241040	
2-Butanone (MEK)	10 U	10	1.0	1	NA	4/1/11 22:31		241040	
2-Hexanone	10 U	10	0.40	1	NA	4/1/11 22:31		241040	
4-Methyl-2-pentanone	10 U	10	0.34	1	NA	4/1/11 22:31		241040	
Acetone	20 U	20	1.6	1	NA	4/1/11 22:31		241040	
Benzene	5.0 U	5.0	0.31	1	NA	4/1/11 22:31		241040	
Bromodichloromethane	5.0 U	5.0	0.41	1	NA	4/1/11 22:31		241040	
Bromoform	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Bromomethane	5.0 U	5.0	0.40	1	NA	4/1/11 22:31		241040	
Carbon Disulfide	10 U	10	0.35	1	NA	4/1/11 22:31		241040	
Carbon Tetrachloride	5.0 U	5.0	0.36	1	NA	4/1/11 22:31		241040	
Chlorobenzene	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Chloroethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Chloroform	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Chloromethane	5.0 U	5.0	0.46	1	NA	4/1/11 22:31		241040	
Cyclohexane	10 U	10	0.30	1	NA	4/1/11 22:31		241040	
Dibromochloromethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	1	NA	4/1/11 22:31		241040	
Dichloromethane	5.0 U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Ethylbenzene	5.0 U	5.0	0.42	1	NA	4/1/11 22:31		241040	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	1	NA	4/1/11 22:31		241040	
Methyl Acetate	10 U	10	0.66	1	NA	4/1/11 22:31		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110329-01
Lab Code: R1101575-024

Service Request: R1101575
Date Collected: 3/29/11
Date Received: 3/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Methylcyclohexane	10	U	10	0.30	1	NA	4/1/11 22:31		241040	
Styrene	5.0	U	5.0	0.35	1	NA	4/1/11 22:31		241040	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/1/11 22:31		241040	
Toluene	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/1/11 22:31		241040	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/1/11 22:31		241040	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 22:31		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	4/1/11 22:31	
Dibromofluoromethane	103	89-119	4/1/11 22:31	
Toluene-d8	100	87-121	4/1/11 22:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: R1101575-MB1

Service Request: R1101575
 Date Collected: NA
 Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	4/7/11 11:10	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	3/29/11 16:05	
Carbon, Total Organic (TOC), Average	9060	1.0	U	mg/L	1.0	1	NA	3/25/11 17:19	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	3/30/11 22:55	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	4/7/11 13:39	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	3/30/11 11:54	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	3/30/11 22:55	
Sulfate	300.0	0.42		mg/L	0.20	1	NA	3/30/11 11:54	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/1/11 13:20	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: R1101575-MB2

Service Request: R1101575
 Date Collected: NA
 Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	3/30/11 11:54	
Carbon, Total Organic (TOC), Average	9060	1.0 U	mg/L	1.0	1	NA	3/31/11 16:09	
Nitrite as Nitrogen	300.0	0.10 U	mg/L	0.10	1	NA	3/31/11 12:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102558-03

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	3/28/11 11:50		240184	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	3/28/11 11:50		240184	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	3/28/11 11:50		240184	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	3/28/11 11:50		240184	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	3/28/11 11:50		240184	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	3/28/11 11:50		240184	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	3/28/11 11:50		240184	
n-Butanol	50	U	50	6.7	1	NA	3/28/11 11:50		240184	
2-Butanone (MEK)	10	U	10	1.0	1	NA	3/28/11 11:50		240184	
2-Hexanone	10	U	10	0.40	1	NA	3/28/11 11:50		240184	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	3/28/11 11:50		240184	
Acetone	20	U	20	1.6	1	NA	3/28/11 11:50		240184	
Benzene	5.0	U	5.0	0.31	1	NA	3/28/11 11:50		240184	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	3/28/11 11:50		240184	
Bromoform	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Bromomethane	5.0	U	5.0	0.40	1	NA	3/28/11 11:50		240184	
Carbon Disulfide	10	U	10	0.35	1	NA	3/28/11 11:50		240184	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	3/28/11 11:50		240184	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Chloroethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Chloroform	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Chloromethane	5.0	U	5.0	0.46	1	NA	3/28/11 11:50		240184	
Cyclohexane	10	U	10	0.30	1	NA	3/28/11 11:50		240184	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	3/28/11 11:50		240184	
Dichloromethane	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	3/28/11 11:50		240184	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	3/28/11 11:50		240184	
Methyl Acetate	10	U	10	0.66	1	NA	3/28/11 11:50		240184	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1102558-03

Service Request: R1101575
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240184

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Methylcyclohexane	10	U	10	0.30	1	NA	3/28/11 11:50		240184	
Styrene	5.0	U	5.0	0.35	1	NA	3/28/11 11:50		240184	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	3/28/11 11:50		240184	
Toluene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	3/28/11 11:50		240184	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
o-Xylene	5.0	U	5.0	0.40	1	NA	3/28/11 11:50		240184	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/28/11 11:50		240184	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	3/28/11 11:50	
Dibromofluoromethane	103	89-119	3/28/11 11:50	
Toluene-d8	101	87-121	3/28/11 11:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102644-09

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,1,2-Trichloroethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.40	1	NA	3/29/11 10:48		240517	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	1	NA	3/29/11 10:48		240517	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.43	1	NA	3/29/11 10:48		240517	
1,2-Dibromoethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,2-Dichlorobenzene	5.0 U	5.0	0.40	1	NA	3/29/11 10:48		240517	
1,2-Dichloroethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
1,2-Dichloropropane	5.0 U	5.0	0.66	1	NA	3/29/11 10:48		240517	
1,3-Dichlorobenzene	5.0 U	5.0	0.36	1	NA	3/29/11 10:48		240517	
1,4-Dichlorobenzene	5.0 U	5.0	0.34	1	NA	3/29/11 10:48		240517	
n-Butanol	50 U	50	6.7	1	NA	3/29/11 10:48		240517	
2-Butanone (MEK)	10 U	10	1.0	1	NA	3/29/11 10:48		240517	
2-Hexanone	10 U	10	0.40	1	NA	3/29/11 10:48		240517	
4-Methyl-2-pentanone	10 U	10	0.34	1	NA	3/29/11 10:48		240517	
Acetone	20 U	20	1.6	1	NA	3/29/11 10:48		240517	
Benzene	5.0 U	5.0	0.31	1	NA	3/29/11 10:48		240517	
Bromodichloromethane	5.0 U	5.0	0.41	1	NA	3/29/11 10:48		240517	
Bromoform	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Bromomethane	5.0 U	5.0	0.40	1	NA	3/29/11 10:48		240517	
Carbon Disulfide	10 U	10	0.35	1	NA	3/29/11 10:48		240517	
Carbon Tetrachloride	5.0 U	5.0	0.36	1	NA	3/29/11 10:48		240517	
Chlorobenzene	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Chloroethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Chloroform	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Chloromethane	5.0 U	5.0	0.46	1	NA	3/29/11 10:48		240517	
Cyclohexane	10 U	10	0.30	1	NA	3/29/11 10:48		240517	
Dibromochloromethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.73	1	NA	3/29/11 10:48		240517	
Dichloromethane	5.0 U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Ethylbenzene	5.0 U	5.0	0.42	1	NA	3/29/11 10:48		240517	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.34	1	NA	3/29/11 10:48		240517	
Methyl Acetate	10 U	10	0.66	1	NA	3/29/11 10:48		240517	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1102644-09

Service Request: R1101575
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240517

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Methylcyclohexane	10	U	10	0.30	1	NA	3/29/11 10:48		240517	
Styrene	5.0	U	5.0	0.35	1	NA	3/29/11 10:48		240517	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	3/29/11 10:48		240517	
Toluene	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	3/29/11 10:48		240517	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
o-Xylene	5.0	U	5.0	0.40	1	NA	3/29/11 10:48		240517	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/29/11 10:48		240517	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	3/29/11 10:48	
Dibromofluoromethane	102	89-119	3/29/11 10:48	
Toluene-d8	103	87-121	3/29/11 10:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102791-04

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	3/31/11 15:22		240878	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	3/31/11 15:22		240878	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	3/31/11 15:22		240878	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	3/31/11 15:22		240878	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	3/31/11 15:22		240878	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	3/31/11 15:22		240878	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	3/31/11 15:22		240878	
n-Butanol	50	U	50	6.7	1	NA	3/31/11 15:22		240878	
2-Butanone (MEK)	10	U	10	1.0	1	NA	3/31/11 15:22		240878	
2-Hexanone	10	U	10	0.40	1	NA	3/31/11 15:22		240878	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	3/31/11 15:22		240878	
Acetone	20	U	20	1.6	1	NA	3/31/11 15:22		240878	
Benzene	5.0	U	5.0	0.31	1	NA	3/31/11 15:22		240878	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	3/31/11 15:22		240878	
Bromoform	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Bromomethane	5.0	U	5.0	0.40	1	NA	3/31/11 15:22		240878	
Carbon Disulfide	10	U	10	0.35	1	NA	3/31/11 15:22		240878	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	3/31/11 15:22		240878	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Chloroethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Chloroform	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Chloromethane	5.0	U	5.0	0.46	1	NA	3/31/11 15:22		240878	
Cyclohexane	10	U	10	0.30	1	NA	3/31/11 15:22		240878	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	3/31/11 15:22		240878	
Dichloromethane	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	3/31/11 15:22		240878	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	3/31/11 15:22		240878	
Methyl Acetate	10	U	10	0.66	1	NA	3/31/11 15:22		240878	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102791-04

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 240878

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Methylcyclohexane	10	U	10	0.30	1	NA	3/31/11 15:22		240878	
Styrene	5.0	U	5.0	0.35	1	NA	3/31/11 15:22		240878	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	3/31/11 15:22		240878	
Toluene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	3/31/11 15:22		240878	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
o-Xylene	5.0	U	5.0	0.40	1	NA	3/31/11 15:22		240878	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	3/31/11 15:22		240878	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	3/31/11 15:22	
Dibromofluoromethane	103	89-119	3/31/11 15:22	
Toluene-d8	104	87-121	3/31/11 15:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102808-04

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/1/11 16:26		241040	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/1/11 16:26		241040	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/1/11 16:26		241040	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/1/11 16:26		241040	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/1/11 16:26		241040	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/1/11 16:26		241040	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/1/11 16:26		241040	
n-Butanol	50	U	50	6.7	1	NA	4/1/11 16:26		241040	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/1/11 16:26		241040	
2-Hexanone	10	U	10	0.40	1	NA	4/1/11 16:26		241040	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/1/11 16:26		241040	
Acetone	20	U	20	1.6	1	NA	4/1/11 16:26		241040	
Benzene	5.0	U	5.0	0.31	1	NA	4/1/11 16:26		241040	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/1/11 16:26		241040	
Bromoform	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/1/11 16:26		241040	
Carbon Disulfide	10	U	10	0.35	1	NA	4/1/11 16:26		241040	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/1/11 16:26		241040	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Chloroform	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/1/11 16:26		241040	
Cyclohexane	10	U	10	0.30	1	NA	4/1/11 16:26		241040	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/1/11 16:26		241040	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/1/11 16:26		241040	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/1/11 16:26		241040	
Methyl Acetate	10	U	10	0.66	1	NA	4/1/11 16:26		241040	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1102808-04

Service Request: R1101575
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241040

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Methylcyclohexane	10	U	10	0.30	1	NA	4/1/11 16:26		241040	
Styrene	5.0	U	5.0	0.35	1	NA	4/1/11 16:26		241040	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/1/11 16:26		241040	
Toluene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/1/11 16:26		241040	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/1/11 16:26		241040	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/1/11 16:26		241040	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	4/1/11 16:26	
Dibromofluoromethane	103	89-119	4/1/11 16:26	
Toluene-d8	104	87-121	4/1/11 16:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1102865-04

Service Request: R1101575
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/3/11 17:10		241118	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/3/11 17:10		241118	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/3/11 17:10		241118	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/3/11 17:10		241118	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/3/11 17:10		241118	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/3/11 17:10		241118	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/3/11 17:10		241118	
n-Butanol	50	U	50	6.7	1	NA	4/3/11 17:10		241118	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/3/11 17:10		241118	
2-Hexanone	10	U	10	0.40	1	NA	4/3/11 17:10		241118	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/3/11 17:10		241118	
Acetone	20	U	20	1.6	1	NA	4/3/11 17:10		241118	
Benzene	5.0	U	5.0	0.31	1	NA	4/3/11 17:10		241118	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/3/11 17:10		241118	
Bromoform	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/3/11 17:10		241118	
Carbon Disulfide	10	U	10	0.35	1	NA	4/3/11 17:10		241118	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/3/11 17:10		241118	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Chloroform	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/3/11 17:10		241118	
Cyclohexane	10	U	10	0.30	1	NA	4/3/11 17:10		241118	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/3/11 17:10		241118	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/3/11 17:10		241118	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/3/11 17:10		241118	
Methyl Acetate	10	U	10	0.66	1	NA	4/3/11 17:10		241118	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1102865-04

Service Request: R1101575
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 241118

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Methylcyclohexane	10	U	10	0.30	1	NA	4/3/11 17:10		241118	
Styrene	5.0	U	5.0	0.35	1	NA	4/3/11 17:10		241118	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/3/11 17:10		241118	
Toluene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/3/11 17:10		241118	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/3/11 17:10		241118	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/3/11 17:10		241118	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	4/3/11 17:10	
Dibromofluoromethane	101	89-119	4/3/11 17:10	
Toluene-d8	104	87-121	4/3/11 17:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: NA
Date Received: NA
Date Analyzed: 4/7/11 10:33

Sample Name: Method Blank
Lab Code: RQ1102968-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star152.run

Analysis Lot: 241604
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: NA
Date Received: NA
Date Analyzed: 3/24/11 15:13

Sample Name: Method Blank
Lab Code: RQ1102523-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC05\DATA\032411\X0005578.D\

Analysis Lot: 240058
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Collected: NA
Date Received: NA
Date Analyzed: 4/7/11 11:05

Sample Name: Method Blank
Lab Code: RQ1102737-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\040711\X0005644.D\

Analysis Lot: 240805
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 4/ 1/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1101575-LCS1			Duplicate Lab Control Sample R1101575-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.82	5.6	105	5.77	5.6	104	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1101575
 Date Analyzed: 3/25/11 -
 4/7/11

Lab Control Sample Summary
 General Chemistry Parameters

Units: mg/L
 Basis: NA

Analyte Name	Method	Lab Control Sample R1101575-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.946	1.00	95	90 - 110
Chloride	300.0	1.94	2.00	97	90 - 110
Iodide	300.0	0.956	1.00	96	90 - 110
Nitrate as Nitrogen	300.0	0.986	1.00	99	90 - 110
Sulfate	300.0	1.86	2.00	93	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	18.9	20.0	95	72 - 115
Carbon, Total Organic (TOC), Average	9060	9.46	10.0	95	86 - 117
Nitrite as Nitrogen	300.0	0.978	1.00	98	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

m80rev

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/30/11 -
3/31/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1101575-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.00	1.00	100	90 - 110
Carbon, Total Organic (TOC), Average	9060	9.73	10.0	97	86 - 117
Nitrite as Nitrogen	300.0	0.966	1.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1101575
 Date Analyzed: 3/28/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 240184

Lab Control Sample
 RQ1102558-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.4	20.0	82	72 - 128
1,1,2,2-Tetrachloroethane	17.6	20.0	88	72 - 131
1,1,2-Trichloroethane	18.1	20.0	90	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.4	20.0	82	71 - 134
1,1-Dichloroethane (1,1-DCA)	17.2	20.0	86	76 - 122
1,1-Dichloroethene (1,1-DCE)	15.7	20.0	79	72 - 129
1,2,4-Trichlorobenzene	18.1	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.9	20.0	95	62 - 131
1,2-Dibromoethane	18.1	20.0	91	78 - 125
1,2-Dichlorobenzene	18.3	20.0	92	79 - 124
1,2-Dichloroethane	20.3	20.0	101	78 - 126
1,2-Dichloropropane	17.4	20.0	87	80 - 123
1,3-Dichlorobenzene	18.4	20.0	92	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	938	1000	94	70 - 130
2-Butanone (MEK)	16.4	20.0	82	60 - 133
2-Hexanone	16.2	20.0	81	61 - 131
4-Methyl-2-pentanone	17.4	20.0	87	61 - 132
Acetone	16.9	20.0	85	59 - 140
Benzene	17.5	20.0	88	78 - 121
Bromodichloromethane	18.7	20.0	93	80 - 125
Bromoform	17.9	20.0	89	73 - 132
Bromomethane	18.5	20.0	92	57 - 144
Carbon Disulfide	18.8	20.0	94	59 - 138
Carbon Tetrachloride	16.9	20.0	85	69 - 135
Chlorobenzene	18.1	20.0	91	80 - 121
Chloroethane	17.8	20.0	89	71 - 130
Chloroform	17.0	20.0	85	78 - 125
Chloromethane	20.1	20.0	100	62 - 133
Cyclohexane	17.6	20.0	88	67 - 127
Dibromochloromethane	17.3	20.0	86	78 - 133
Dichlorodifluoromethane (CFC 12)	23.6	20.0	118	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 240184

**Lab Control Sample
 RQ1102558-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.4	20.0	82	75 - 125
Ethylbenzene	18.4	20.0	92	78 - 123
Isopropylbenzene (Cumene)	18.8	20.0	94	73 - 133
Methyl Acetate	16.9	20.0	85	57 - 157
Methyl tert-Butyl Ether	17.3	20.0	87	75 - 126
Methylcyclohexane	17.0	20.0	85	64 - 133
Styrene	18.4	20.0	92	80 - 132
Tetrachloroethene (PCE)	18.3	20.0	92	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	17.1	20.0	86	74 - 127
Trichlorofluoromethane (CFC 11)	19.6	20.0	98	71 - 139
Vinyl Chloride	20.7	20.0	104	71 - 136
cis-1,2-Dichloroethene	17.1	20.0	85	78 - 122
cis-1,3-Dichloropropene	17.8	20.0	89	77 - 125
m,p-Xylenes	35.1	40.0	88	79 - 126
n-Butyl Acetate	17.9	20.0	90	54 - 127
o-Xylene	17.8	20.0	89	79 - 126
trans-1,2-Dichloroethene	15.4	20.0	77	75 - 121
trans-1,3-Dichloropropene	18.1	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/29/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 240517

**Lab Control Sample
 RQ1102644-10**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.9	20.0	84	72 - 128
1,1,2,2-Tetrachloroethane	17.7	20.0	88	72 - 131
1,1,2-Trichloroethane	18.4	20.0	92	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.7	20.0	84	71 - 134
1,1-Dichloroethane (1,1-DCA)	17.4	20.0	87	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.3	20.0	87	72 - 129
1,2,4-Trichlorobenzene	20.5	20.0	102	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.6	20.0	98	62 - 131
1,2-Dibromoethane	19.4	20.0	97	78 - 125
1,2-Dichlorobenzene	20.6	20.0	103	79 - 124
1,2-Dichloroethane	19.6	20.0	98	78 - 126
1,2-Dichloropropane	18.3	20.0	92	80 - 123
1,3-Dichlorobenzene	20.7	20.0	103	78 - 124
1,4-Dichlorobenzene	20.7	20.0	103	78 - 123
n-Butanol	820	1000	82	70 - 130
2-Butanone (MEK)	16.1	20.0	80	60 - 133
2-Hexanone	17.7	20.0	88	61 - 131
4-Methyl-2-pentanone	18.1	20.0	91	61 - 132
Acetone	14.5	20.0	72	59 - 140
Benzene	18.8	20.0	94	78 - 121
Bromodichloromethane	18.8	20.0	94	80 - 125
Bromoform	19.2	20.0	96	73 - 132
Bromomethane	20.3	20.0	101	57 - 144
Carbon Disulfide	18.8	20.0	94	59 - 138
Carbon Tetrachloride	17.7	20.0	89	69 - 135
Chlorobenzene	20.5	20.0	102	80 - 121
Chloroethane	19.6	20.0	98	71 - 130
Chloroform	16.6	20.0	83	78 - 125
Chloromethane	20.2	20.0	101	62 - 133
Cyclohexane	17.3	20.0	87	67 - 127
Dibromochloromethane	19.0	20.0	95	78 - 133
Dichlorodifluoromethane (CFC 12)	22.9	20.0	114	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/29/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 240517

**Lab Control Sample
 RQ1102644-10**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.9	20.0	84	75 - 125
Ethylbenzene	19.7	20.0	98	78 - 123
Isopropylbenzene (Cumene)	20.4	20.0	102	73 - 133
Methyl Acetate	16.3	20.0	81	57 - 157
Methyl tert-Butyl Ether	17.1	20.0	86	75 - 126
Methylcyclohexane	16.9	20.0	84	64 - 133
Styrene	19.9	20.0	99	80 - 132
Tetrachloroethene (PCE)	21.9	20.0	110	72 - 131
Toluene	19.3	20.0	97	78 - 122
Trichloroethene (TCE)	18.1	20.0	90	74 - 127
Trichlorofluoromethane (CFC 11)	19.5	20.0	97	71 - 139
Vinyl Chloride	22.8	20.0	114	71 - 136
cis-1,2-Dichloroethene	18.0	20.0	90	78 - 122
cis-1,3-Dichloropropene	17.3	20.0	86	77 - 125
m,p-Xylenes	39.7	40.0	99	79 - 126
n-Butyl Acetate	18.4	20.0	92	54 - 127
o-Xylene	20.0	20.0	100	79 - 126
trans-1,2-Dichloroethene	16.6	20.0	83	75 - 121
trans-1,3-Dichloropropene	18.0	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1101575
 Date Analyzed: 3/31/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 240878

Lab Control Sample
 RQ1102791-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.5	20.0	93	72 - 128
1,1,2,2-Tetrachloroethane	18.4	20.0	92	72 - 131
1,1,2-Trichloroethane	19.5	20.0	97	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.5	20.0	92	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.2	20.0	101	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.9	20.0	90	72 - 129
1,2,4-Trichlorobenzene	21.4	20.0	107	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.3	20.0	107	62 - 131
1,2-Dibromoethane	19.9	20.0	99	78 - 125
1,2-Dichlorobenzene	20.3	20.0	102	79 - 124
1,2-Dichloroethane	19.9	20.0	100	78 - 126
1,2-Dichloropropane	20.4	20.0	102	80 - 123
1,3-Dichlorobenzene	19.8	20.0	99	78 - 124
1,4-Dichlorobenzene	19.6	20.0	98	78 - 123
n-Butanol	991	1000	99	70 - 130
2-Butanone (MEK)	18.6	20.0	93	60 - 133
2-Hexanone	19.3	20.0	97	61 - 131
4-Methyl-2-pentanone	19.8	20.0	99	61 - 132
Acetone	17.4	20.0	87	59 - 140
Benzene	19.7	20.0	99	78 - 121
Bromodichloromethane	19.3	20.0	96	80 - 125
Bromoform	20.5	20.0	102	73 - 132
Bromomethane	17.1	20.0	85	57 - 144
Carbon Disulfide	21.4	20.0	107	59 - 138
Carbon Tetrachloride	18.6	20.0	93	69 - 135
Chlorobenzene	19.5	20.0	98	80 - 121
Chloroethane	18.9	20.0	95	71 - 130
Chloroform	19.3	20.0	96	78 - 125
Chloromethane	19.0	20.0	95	62 - 133
Cyclohexane	18.8	20.0	94	67 - 127
Dibromochloromethane	20.7	20.0	104	78 - 133
Dichlorodifluoromethane (CFC 12)	17.2	20.0	86	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/31/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 240878

**Lab Control Sample
 RQ1102791-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.3	20.0	91	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	22.8	20.0	114	73 - 133
Methyl Acetate	18.2	20.0	91	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	20.3	20.0	101	64 - 133
Styrene	20.6	20.0	103	80 - 132
Tetrachloroethene (PCE)	19.1	20.0	96	72 - 131
Toluene	20.1	20.0	100	78 - 122
Trichloroethene (TCE)	19.0	20.0	95	74 - 127
Trichlorofluoromethane (CFC 11)	18.6	20.0	93	71 - 139
Vinyl Chloride	19.2	20.0	96	71 - 136
cis-1,2-Dichloroethene	19.4	20.0	97	78 - 122
cis-1,3-Dichloropropene	18.9	20.0	95	77 - 125
m,p-Xylenes	41.2	40.0	103	79 - 126
n-Butyl Acetate	20.3	20.0	102	54 - 127
o-Xylene	20.5	20.0	102	79 - 126
trans-1,2-Dichloroethene	19.4	20.0	97	75 - 121
trans-1,3-Dichloropropene	18.9	20.0	95	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1101575
 Date Analyzed: 4/ 1/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 241040

Lab Control Sample
 RQ1102808-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.3	20.0	82	72 - 128
1,1,2,2-Tetrachloroethane	17.9	20.0	89	72 - 131
1,1,2-Trichloroethane	17.6	20.0	88	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.6	20.0	78	71 - 134
1,1-Dichloroethane (1,1-DCA)	17.7	20.0	89	76 - 122
1,1-Dichloroethene (1,1-DCE)	15.5	20.0	78	72 - 129
1,2,4-Trichlorobenzene	19.5	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.6	20.0	88	62 - 131
1,2-Dibromoethane	17.3	20.0	87	78 - 125
1,2-Dichlorobenzene	18.6	20.0	93	79 - 124
1,2-Dichloroethane	18.0	20.0	90	78 - 126
1,2-Dichloropropane	17.8	20.0	89	80 - 123
1,3-Dichlorobenzene	18.2	20.0	91	78 - 124
1,4-Dichlorobenzene	18.3	20.0	91	78 - 123
n-Butanol	938	1000	94	70 - 130
2-Butanone (MEK)	17.5	20.0	87	60 - 133
2-Hexanone	16.8	20.0	84	61 - 131
4-Methyl-2-pentanone	18.9	20.0	95	61 - 132
Acetone	19.3	20.0	96	59 - 140
Benzene	17.7	20.0	89	78 - 121
Bromodichloromethane	17.5	20.0	87	80 - 125
Bromoform	17.9	20.0	89	73 - 132
Bromomethane	15.4	20.0	77	57 - 144
Carbon Disulfide	22.3	20.0	111	59 - 138
Carbon Tetrachloride	16.0	20.0	80	69 - 135
Chlorobenzene	17.4	20.0	87	80 - 121
Chloroethane	16.4	20.0	82	71 - 130
Chloroform	17.3	20.0	87	78 - 125
Chloromethane	17.1	20.0	86	62 - 133
Cyclohexane	19.3	20.0	97	67 - 127
Dibromochloromethane	17.2	20.0	86	78 - 133
Dichlorodifluoromethane (CFC 12)	14.3	20.0	71	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 4/ 1/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 241040

**Lab Control Sample
 RQ1102808-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.2	20.0	81	75 - 125
Ethylbenzene	17.6	20.0	88	78 - 123
Isopropylbenzene (Cumene)	20.2	20.0	101	73 - 133
Methyl Acetate	18.4	20.0	92	57 - 157
Methyl tert-Butyl Ether	17.7	20.0	88	75 - 126
Methylcyclohexane	20.2	20.0	101	64 - 133
Styrene	17.7	20.0	89	80 - 132
Tetrachloroethene (PCE)	17.5	20.0	88	72 - 131
Toluene	17.6	20.0	88	78 - 122
Trichloroethene (TCE)	16.7	20.0	84	74 - 127
Trichlorofluoromethane (CFC 11)	16.8	20.0	84	71 - 139
Vinyl Chloride	17.9	20.0	89	71 - 136
cis-1,2-Dichloroethene	16.7	20.0	83	78 - 122
cis-1,3-Dichloropropene	16.5	20.0	83	77 - 125
m,p-Xylenes	35.1	40.0	88	79 - 126
n-Butyl Acetate	19.8	20.0	99	54 - 127
o-Xylene	17.5	20.0	88	79 - 126
trans-1,2-Dichloroethene	16.2	20.0	81	75 - 121
trans-1,3-Dichloropropene	16.8	20.0	84	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 4/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 241118

**Lab Control Sample
 RQ1102865-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.9	20.0	89	72 - 128
1,1,2,2-Tetrachloroethane	17.5	20.0	87	72 - 131
1,1,2-Trichloroethane	18.2	20.0	91	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.7	20.0	89	71 - 134
1,1-Dichloroethane (1,1-DCA)	18.9	20.0	95	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.9	20.0	90	72 - 129
1,2,4-Trichlorobenzene	20.5	20.0	103	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.7	20.0	93	62 - 131
1,2-Dibromoethane	18.5	20.0	93	78 - 125
1,2-Dichlorobenzene	20.1	20.0	100	79 - 124
1,2-Dichloroethane	18.8	20.0	94	78 - 126
1,2-Dichloropropane	19.4	20.0	97	80 - 123
1,3-Dichlorobenzene	19.9	20.0	99	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	911	1000	91	70 - 130
2-Butanone (MEK)	17.9	20.0	89	60 - 133
2-Hexanone	17.8	20.0	89	61 - 131
4-Methyl-2-pentanone	18.2	20.0	91	61 - 132
Acetone	17.6	20.0	88	59 - 140
Benzene	19.1	20.0	96	78 - 121
Bromodichloromethane	18.8	20.0	94	80 - 125
Bromoform	20.5	20.0	103	73 - 132
Bromomethane	15.7	20.0	79	57 - 144
Carbon Disulfide	23.3	20.0	117	59 - 138
Carbon Tetrachloride	17.9	20.0	89	69 - 135
Chlorobenzene	19.3	20.0	97	80 - 121
Chloroethane	19.4	20.0	97	71 - 130
Chloroform	18.6	20.0	93	78 - 125
Chloromethane	18.7	20.0	94	62 - 133
Cyclohexane	18.5	20.0	93	67 - 127
Dibromochloromethane	19.9	20.0	99	78 - 133
Dichlorodifluoromethane (CFC 12)	16.8	20.0	84	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34/ TR0272
 Sample Matrix: Water

Service Request: R1101575
 Date Analyzed: 4/3/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 241118

Lab Control Sample
 RQ1102865-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.2	20.0	91	75 - 125
Ethylbenzene	19.9	20.0	100	78 - 123
Isopropylbenzene (Cumene)	22.7	20.0	113	73 - 133
Methyl Acetate	17.4	20.0	87	57 - 157
Methyl tert-Butyl Ether	17.9	20.0	90	75 - 126
Methylcyclohexane	19.7	20.0	98	64 - 133
Styrene	20.1	20.0	100	80 - 132
Tetrachloroethene (PCE)	19.0	20.0	95	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	17.9	20.0	90	74 - 127
Trichlorofluoromethane (CFC 11)	18.3	20.0	91	71 - 139
Vinyl Chloride	19.6	20.0	98	71 - 136
cis-1,2-Dichloroethene	18.5	20.0	92	78 - 122
cis-1,3-Dichloropropene	17.6	20.0	88	77 - 125
m,p-Xylenes	42.0	40.0	105	79 - 126
n-Butyl Acetate	19.4	20.0	97	54 - 127
o-Xylene	20.8	20.0	104	79 - 126
trans-1,2-Dichloroethene	19.1	20.0	96	75 - 121
trans-1,3-Dichloropropene	17.9	20.0	90	69 - 127

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 4/ 7/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 241604

Analyte Name	Lab Control Sample RQ1102968-02			Duplicate Lab Control Sample RQ1102968-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	27.0	26.1	104	25.8	26.1	99	55 - 165	5	30
Ethene	24.6	24.3	101	23.5	24.3	97	48 - 163	4	30
Methane	27.4	26.2	104	26.0	26.2	99	61 - 154	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 3/24/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 240058

Analyte Name	Lab Control Sample RQ1102523-02			Duplicate Lab Control Sample RQ1102523-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.05	0.998	105	1.05	0.998	105	70 - 130	<1	30
Acetic Acid	9.54	9.97	96	9.52	9.97	95	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.5	9.98	105	10.1	9.98	102	82 - 118	3	30
Lactic Acid	9.85	10.0	98	9.79	10.0	98	70 - 117	<1	30
Propionic Acid	10.0	9.97	100	10.1	9.97	101	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request: R1101575
Date Analyzed: 4/7/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 240805

Analyte Name	Lab Control Sample RQ1102737-02			Duplicate Lab Control Sample RQ1102737-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.05	0.998	105	1.08	0.998	108	70 - 130	3	30
Acetic Acid	9.20	9.97	92	9.36	9.97	94	70 - 135	2	30
Butanoic Acid (Butyric Acid)	9.19	9.98	92	9.15	9.98	92	82 - 118	<1	30
Lactic Acid	9.26	10.0	92	9.58	10.0	96	70 - 117	3	30
Propionic Acid	9.90	9.97	99	9.95	9.97	100	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature] for Doc Darity

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20110322	3/22/2011	1029	-001	GW
LC34-IW0002L-027.5-20110322	3/22/2011	1434	-002	GW
LC34-IW0002D-037.5-20110322	3/22/2011	1405	-003	GW
LC34-BW0001C-038.5-20110322	3/22/2011	1501	-004	GW
LC34-BW0002C-038.5-20110322	3/22/2011	1253	-005	GW
LC34-BW0003C-038.5-20110322	3/22/2011	1621	-006	GW
LC34-RW0008-052.0-20110322	3/22/2011	1121	-007	GW
LC34-IW0002D1-052.5-20110322	3/22/2011	1330	-008	GW
LC34-BW0001E-052.5-20110322	3/22/2011	1525	-009	GW
LC34-BW0003E-052.5-20110322	3/22/2011	1552	010E	GW

Number of Containers

VOCs (8260C) plus n-butyl acetate

VFAs (300)

Bromide and Iodide (300.0)

TOC (9060A)

REMARKS

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?; NASA KEDD

Invoice Information
 P.O. #
 Bill to: TR0272

Comments/Special Instructions:

R1101575
 Geosyntec Consultants
 ESTCP PED LC34



RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Theresa Campbell
 Firm: GEOSYNTEC
 Date/Time: 3/22/11 0900

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Lefore
 Firm: CAI
 Date/Time: 3/22/11 0831

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Project Name: ESTCP PED LC34 Project Number: TR0272
Project Manager: Cory Repta Company: Geosyntec
Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
Sampler's Signature: WA SWAY for Joe DMIT

Number of Containers 1
VOCs (8260C) plus n- butyl acetate 1

Sample I.D.	Date	Time	LAB ID	Matrix	REMARKS
LC34-QC0001-000.0-20110322	3/22/2011	1400	NA vol -011	GW	

Comments/Special Instructions:

REPORT REQUIREMENTS
I. Routine Report: Results and Method Blank (Surrogate, as required)
II. Results w/ QC (Dup., MS, MSD as req)
III. Results (with QC and Calibration Summaries)
IV. ASP-B
V. CLP
X EDD?; NASA KEDD

TURNAROUND REQUIREMENTS
24 hr 48 hr 5 BD
X Standard (15 BD)
Provide FAX Preliminary Results
Requested Report Date:
Invoice Information
P.O. #
Bill to: TR0272

-012 LC34-TB R1101575
80110322-01 added 3/25/11

RELINQUISHED BY:
Signature: [Signature]
Printed Name: SIDE SARTUT
Firm: Geosyntec
Date/Time: 3/22/11 1740

RECEIVED BY:
Signature: [Signature]
Printed Name: Bethany / Corine
Firm: CAS
Date/Time: 3/24/11 0931

RELINQUISHED BY:
Signature: _____
Printed Name: _____
Firm: _____
Date/Time: _____

RECEIVED BY:
Signature: _____
Printed Name: _____
Firm: _____
Date/Time: _____

Cooler Receipt And Preservation Check Form

Project/Client Acetylene Folder Number R1101575

Cooler received on 3/24/11 by: BD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 90 60

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 3/24/11 0938

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: Sample OK KB
 PC Secondary Review: KB 3/24/11

Cooler Breakdown: Date: 3/24/11 Time: 1140 by: BD

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH									No = Samples were preserved at lab as listed
≤2	HNO ₃									
≤2	H ₂ SO ₄			<u>WC108001A</u>	<u>2/12</u>					
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						PM OK to Adjust:
	Na ₂ S ₂ O ₃	-	-							
	Zn Aceta	-	-							
	HCl	*	*							

*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet

Bottle lot numbers: 0-235-0072, 071210-288

Other Comments: H₃PO₄ WC92115F exp: 11/14

PC Secondary Review: KB 4/15/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20110328	3/28/2011	926	-013	GW
LC34-IW00021-027.5-20110329	3/29/2011	1213	-014	GW
LC34-IW0002D-037.5-20110328	3/28/2011	1122	-015	GW
LC34-BW0001C-038.5-20110329	3/29/2011	1114	-016	GW
LC34-BW0002C-038.5-20110329	3/29/2011	1749	951 -017 925	GW
LC34-BW0003C-038.5-20110329	3/29/2011	1016	-018	GW
LC34-RW0008-052.0-20110328	3/28/2011	1019	-019	GW
LC34-IW0002D1-052.5-20110328	3/28/2011	1057	-020	GW
LC34-BW0001E-052.5-20110329	3/29/2011	1149	-021	GW
LC34-BW0003E-052.5-20110329	3/29/2011	1049	-022	GW

Number of Containers	Analysis Requested							REMARKS
	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)	Anions (300.0)	
7	1	1	1	1	1	1	1	1
1	1							
1	1							
1	1							
1	1							
1	1							
7	1	1	1	1	1	1	1	1
1	1							
1	1							

Comments/Special Instructions:

URNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

R1101575
 GeoSyntec Consultants
 ESTCP PED LC34



RELINQUISHED BY:
 Signature: _____
 Printed Name: David Semore
 Firm: Geosyntec
 Date/Time: 3/29/11 1700

RECEIVED BY:
 Signature: _____
 Printed Name: F E D F A
 Firm: _____
 Date/Time: 3/29/11 1700

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: Geosyntec
 Firm: CAS
 Date/Time: 3/30/11 1159

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609


585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: _____

Analysis Requirements

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	REMARKS
1	1								
1	1								
1	1								
1	1								
0									
0									
0									
0									
0									
0									

Comments/Special Instructions:
R1101575
 GeoSyntec Consultants
 ESTCP PED LC34



Sample I.D.	Date	Time	LAB ID	Matrix
LC34-QC0002-000.0-20110328	3/28/2011	NA	-023	GW
LC34-EP0001-000.0-20110329	3/29/2011		0ms	GW
LC34-EE0002-000.0-20110329	3/29/2011		0ms	GW
LC34-TB-20110329	3/29/2011	NA	-024	GW
				GW
				GW
				GW
				GW
				GW
				GW

URNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: Dana Silmore
 Firm: GeoSyntec
 Date/Time: 3/29/11 1700

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Cooler Receipt And Preservation

R1101575

GeoSynTec Consultants
ESTCP PED LC34

Project/Client GeoSynTec Folder Number _____



Cooler received on 3/30/11 by: APD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A / Temp Blank via
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 3°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 3/30/11 1204

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 3/30/11

Cooler Breakdown: Date: 3/30/11 Time: 1336 by: DM

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-	WC02239C	7/11	*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	4110020	1/12				

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 0-235-003, 0-235-002, 071210-288, 070510-2AA

Other Comments: _____

PC Secondary Review: KB 4/15/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

May 06, 2011

Service Request No: R1101876

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272

Dear Mr. Repta:


Enclosed are the results of the sample(s) submitted to our laboratory on April 8, 2011. For your reference, these analyses have been assigned our service request number **R1101876**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 56

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1101575
Date Received: 4/8/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Sixteen (16) water samples including one (1) Trip Blank were collected by the client on 4/1,7/11 and were received for analysis at Columbia Analytical Services on 4/8/11 via a national courier. The samples were received at a cooler temperature of 4°C, within the 0-6°C guidelines.

Volatile Organic Compounds

Sixteen (16) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except the following: the minimum response factor for Carbon Tetrachloride was not met in the ICAL/Daily CCV from 4/12/11. The data has been considered reportable since the MRL has been verified by the low standard in the calibration.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. It was found that samples LC34-EF0001-000.0-20110401 and LC34-EF0002-000.0-20110401 (CAS Submission #R1101876-011 and -012 respectively) were collected in preserved vials. These 2 samples were collected on 4/1/11 and received on 4/8/11 and were run within the 14 day holding time for preserved vials (pH <2). The Vials themselves were also checked and found to be labeled as preserved. The preservative would inhibit the N-Butyl Acetate value for these samples.

The Laboratory Method Blanks were free from contamination except for low level hits between the MRL and MDL for the compound 1,2,4-Trichlorobenzene on the 4/12/11 and 4/13/11 analytical runs.

No other analytical or QC problems were encountered.

Approved by



Date



000002

HPLC Methodology

Two (2) water samples were analyzed for Organic Acids by HPLC.

All Initial and Continuing Calibration Criteria were met.

Batch QC is included in the report. All LCS and LCSD recoveries were within QC acceptance limits. All RPD calculations were acceptable.

All samples were analyzed within the proper holding time for the method.

The Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Inorganic Parameters

Two (2) water samples were analyzed for TOC by method 9060 and Bromide and Iodide by IC method 300.0. The TOC Quad average has been reported.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

Approved by

Laron Bunker

Date

5/6/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1101876

<u>Lab ID</u>	<u>Client ID</u>
R1101876-001	LC34-RW0007-038.5-20110407
R1101876-002	LC34-IW0002I-027.5-20110407
R1101876-003	LC34-IW0002D-037.5-20110407
R1101876-004	LC34-BW0001C-038.5-20110407
R1101876-005	LC34-BW0002C-038.5-20110407
R1101876-006	LC34-BW0003C-038.5-20110407
R1101876-007	LC34-RW0008-052.0-20110407
R1101876-008	LC34-IW0002D1-052.5-20110407
R1101876-009	LC34-BW0001E-052.5-20110407
R1101876-010	LC34-BW0003E-052.5-20110407
R1101876-011	LC34-EF0001-000.0-20110401
R1101876-012	LC34-EF0002-000.0-20110401
R1101876-013	LC34-EF0003-000.0-20110407
R1101876-014	LC34-EF0004-000.0-20110407
R1101876-015	LC34-TB-20110407
R1101876-016	LC34-FD-20110407-01

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
Connecticut ID # PH0556
Delaware Accredited
DoD ELAP #65817
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032

Nebraska Accredited
Nevada ID # NY-00032
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110407
Lab Code: R1101876-001

Service Request: R1101876
Date Collected: 4/ 7/11 0953
Date Received: 4/ 8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.3	mg/L	1.0	10	NA	4/11/11 15:50	
Carbon, Total Organic (TOC), Average	9060	5.3	mg/L	1.0	1	NA	4/17/11 13:16	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 14:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110407
 Lab Code: R1101876-001

Service Request: R1101876
 Date Collected: 4/7/11 0953
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		1300	100	250	NA	4/13/11 03:31		242051	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/13/11 03:31		242051	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/13/11 03:31		242051	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/13/11 03:31		242051	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/13/11 03:31		242051	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/13/11 03:31		242051	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/13/11 03:31		242051	
n-Butanol	13000	U	13000	1700	250	NA	4/13/11 03:31		242051	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/13/11 03:31		242051	
2-Hexanone	2500	U	2500	100	250	NA	4/13/11 03:31		242051	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/13/11 03:31		242051	
Acetone	5000	U	5000	400	250	NA	4/13/11 03:31		242051	
Benzene	1300	U	1300	78	250	NA	4/13/11 03:31		242051	
Bromodichloromethane	1300	U	1300	110	250	NA	4/13/11 03:31		242051	
Bromoform	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Bromomethane	1300	U	1300	100	250	NA	4/13/11 03:31		242051	
Carbon Disulfide	2500	U	2500	88	250	NA	4/13/11 03:31		242051	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/13/11 03:31		242051	
Chlorobenzene	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Chloroethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Chloroform	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Chloromethane	1300	U	1300	120	250	NA	4/13/11 03:31		242051	
Cyclohexane	2500	U	2500	75	250	NA	4/13/11 03:31		242051	
Dibromochloromethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/13/11 03:31		242051	
Dichloromethane	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Ethylbenzene	1300	U	1300	110	250	NA	4/13/11 03:31		242051	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/13/11 03:31		242051	
Methyl Acetate	2500	U	2500	170	250	NA	4/13/11 03:31		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110407
Lab Code: R1101876-001

Service Request: R1101876
Date Collected: 4/7/11 0953
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Methylcyclohexane	2500	U	2500	75	250	NA	4/13/11 03:31		242051	
Styrene	1300	U	1300	88	250	NA	4/13/11 03:31		242051	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/13/11 03:31		242051	
Toluene	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Trichloroethene (TCE)	14000		1300	75	250	NA	4/13/11 03:31		242051	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
Vinyl Chloride	1000	J	1300	75	250	NA	4/13/11 03:31		242051	
cis-1,2-Dichloroethene	33000		1300	75	250	NA	4/13/11 03:31		242051	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
m,p-Xylenes	1300	U	1300	210	250	NA	4/13/11 03:31		242051	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/13/11 03:31		242051	
o-Xylene	1300	U	1300	100	250	NA	4/13/11 03:31		242051	
trans-1,2-Dichloroethene	290	J	1300	75	250	NA	4/13/11 03:31		242051	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 03:31		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/13/11 03:31	
Dibromofluoromethane	104	89-119	4/13/11 03:31	
Toluene-d8	109	87-121	4/13/11 03:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Collected: 4/ 7/11 0953
Date Received: 4/ 8/11
Date Analyzed: 4/11/11 14:40

Sample Name: LC34-RW0007-038.5-20110407
Lab Code: R1101876-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\041111\X0005667.D\

Analysis Lot: 241933
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	24	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20110407
 Lab Code: R1101876-002

Service Request: R1101876
 Date Collected: 4/7/11 1127
 Date Received: 4/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	77000		2500	200	500	NA	4/13/11 04:01		242051	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/13/11 04:01		242051	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/13/11 04:01		242051	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/13/11 04:01		242051	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/13/11 04:01		242051	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/13/11 04:01		242051	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/13/11 04:01		242051	
n-Butanol	25000	U	25000	3400	500	NA	4/13/11 04:01		242051	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/13/11 04:01		242051	
2-Hexanone	5000	U	5000	200	500	NA	4/13/11 04:01		242051	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/13/11 04:01		242051	
Acetone	10000	U	10000	800	500	NA	4/13/11 04:01		242051	
Benzene	2500	U	2500	160	500	NA	4/13/11 04:01		242051	
Bromodichloromethane	2500	U	2500	210	500	NA	4/13/11 04:01		242051	
Bromoform	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Bromomethane	2500	U	2500	200	500	NA	4/13/11 04:01		242051	
Carbon Disulfide	5000	U	5000	180	500	NA	4/13/11 04:01		242051	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/13/11 04:01		242051	
Chlorobenzene	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Chloroethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Chloroform	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Chloromethane	2500	U	2500	230	500	NA	4/13/11 04:01		242051	
Cyclohexane	5000	U	5000	150	500	NA	4/13/11 04:01		242051	
Dibromochloromethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/13/11 04:01		242051	
Dichloromethane	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Ethylbenzene	2500	U	2500	210	500	NA	4/13/11 04:01		242051	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/13/11 04:01		242051	
Methyl Acetate	5000	U	5000	330	500	NA	4/13/11 04:01		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20110407
 Lab Code: R1101876-002

Service Request: R1101876
 Date Collected: 4/7/11 1127
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Methylcyclohexane	5000	U	5000	150	500	NA	4/13/11 04:01		242051	
Styrene	2500	U	2500	180	500	NA	4/13/11 04:01		242051	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/13/11 04:01		242051	
Toluene	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Trichloroethene (TCE)	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
Vinyl Chloride	1100	J	2500	150	500	NA	4/13/11 04:01		242051	
cis-1,2-Dichloroethene	23000		2500	150	500	NA	4/13/11 04:01		242051	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
m,p-Xylenes	2500	U	2500	410	500	NA	4/13/11 04:01		242051	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/13/11 04:01		242051	
o-Xylene	2500	U	2500	200	500	NA	4/13/11 04:01		242051	
trans-1,2-Dichloroethene	510	J	2500	150	500	NA	4/13/11 04:01		242051	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/13/11 04:01		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/13/11 04:01	
Dibromofluoromethane	105	89-119	4/13/11 04:01	
Toluene-d8	110	87-121	4/13/11 04:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D-037.5-20110407
 Lab Code: R1101876-003

Service Request: R1101876
 Date Collected: 4/7/11 1052
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	6500		1300	100	250	NA	4/13/11 04:32		242051	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/13/11 04:32		242051	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/13/11 04:32		242051	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/13/11 04:32		242051	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/13/11 04:32		242051	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/13/11 04:32		242051	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/13/11 04:32		242051	
n-Butanol	13000	U	13000	1700	250	NA	4/13/11 04:32		242051	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/13/11 04:32		242051	
2-Hexanone	2500	U	2500	100	250	NA	4/13/11 04:32		242051	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/13/11 04:32		242051	
Acetone	5000	U	5000	400	250	NA	4/13/11 04:32		242051	
Benzene	1300	U	1300	78	250	NA	4/13/11 04:32		242051	
Bromodichloromethane	1300	U	1300	110	250	NA	4/13/11 04:32		242051	
Bromoform	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Bromomethane	1300	U	1300	100	250	NA	4/13/11 04:32		242051	
Carbon Disulfide	2500	U	2500	88	250	NA	4/13/11 04:32		242051	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/13/11 04:32		242051	
Chlorobenzene	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Chloroethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Chloroform	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Chloromethane	1300	U	1300	120	250	NA	4/13/11 04:32		242051	
Cyclohexane	2500	U	2500	75	250	NA	4/13/11 04:32		242051	
Dibromochloromethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/13/11 04:32		242051	
Dichloromethane	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Ethylbenzene	1300	U	1300	110	250	NA	4/13/11 04:32		242051	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/13/11 04:32		242051	
Methyl Acetate	2500	U	2500	170	250	NA	4/13/11 04:32		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110407
Lab Code: R1101876-003

Service Request: R1101876
Date Collected: 4/7/11 1052
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Methylcyclohexane	2500	U	2500	75	250	NA	4/13/11 04:32		242051	
Styrene	1300	U	1300	88	250	NA	4/13/11 04:32		242051	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/13/11 04:32		242051	
Toluene	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Trichloroethene (TCE)	1100	J	1300	75	250	NA	4/13/11 04:32		242051	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
Vinyl Chloride	2800		1300	75	250	NA	4/13/11 04:32		242051	
cis-1,2-Dichloroethene	28000		1300	75	250	NA	4/13/11 04:32		242051	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
m,p-Xylenes	1300	U	1300	210	250	NA	4/13/11 04:32		242051	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/13/11 04:32		242051	
o-Xylene	1300	U	1300	100	250	NA	4/13/11 04:32		242051	
trans-1,2-Dichloroethene	360	J	1300	75	250	NA	4/13/11 04:32		242051	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 04:32		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/13/11 04:32	
Dibromofluoromethane	106	89-119	4/13/11 04:32	
Toluene-d8	110	87-121	4/13/11 04:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110407
Lab Code: R1101876-004

Service Request: R1101876
Date Collected: 4/ 7/11 1312
Date Received: 4/ 8/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	55000	D	2500	200	500	NA	4/13/11 17:18		242280	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,1-Dichloroethene (1,1-DCE)	140	J	1300	93	250	NA	4/13/11 05:02		242051	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/13/11 05:02		242051	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/13/11 05:02		242051	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/13/11 05:02		242051	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/13/11 05:02		242051	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/13/11 05:02		242051	
n-Butanol	13000	U	13000	1700	250	NA	4/13/11 05:02		242051	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/13/11 05:02		242051	
2-Hexanone	2500	U	2500	100	250	NA	4/13/11 05:02		242051	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/13/11 05:02		242051	
Acetone	5000	U	5000	400	250	NA	4/13/11 05:02		242051	
Benzene	1300	U	1300	78	250	NA	4/13/11 05:02		242051	
Bromodichloromethane	1300	U	1300	110	250	NA	4/13/11 05:02		242051	
Bromoform	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Bromomethane	1300	U	1300	100	250	NA	4/13/11 05:02		242051	
Carbon Disulfide	2500	U	2500	88	250	NA	4/13/11 05:02		242051	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/13/11 05:02		242051	
Chlorobenzene	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Chloroethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Chloroform	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Chloromethane	1300	U	1300	120	250	NA	4/13/11 05:02		242051	
Cyclohexane	2500	U	2500	75	250	NA	4/13/11 05:02		242051	
Dibromochloromethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/13/11 05:02		242051	
Dichloromethane	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Ethylbenzene	1300	U	1300	110	250	NA	4/13/11 05:02		242051	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/13/11 05:02		242051	
Methyl Acetate	2500	U	2500	170	250	NA	4/13/11 05:02		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110407
Lab Code: R1101876-004

Service Request: R1101876
Date Collected: 4/7/11 1312
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Methylcyclohexane	2500	U	2500	75	250	NA	4/13/11 05:02		242051	
Styrene	1300	U	1300	88	250	NA	4/13/11 05:02		242051	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/13/11 05:02		242051	
Toluene	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Trichloroethene (TCE)	54000	D	2500	150	500	NA	4/13/11 17:18		242280	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
Vinyl Chloride	570	J	1300	75	250	NA	4/13/11 05:02		242051	
cis-1,2-Dichloroethene	29000		1300	75	250	NA	4/13/11 05:02		242051	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
m,p-Xylenes	1300	U	1300	210	250	NA	4/13/11 05:02		242051	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/13/11 05:02		242051	
o-Xylene	1300	U	1300	100	250	NA	4/13/11 05:02		242051	
trans-1,2-Dichloroethene	280	J	1300	75	250	NA	4/13/11 05:02		242051	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/13/11 05:02		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 05:02	
Dibromofluoromethane	105	89-119	4/13/11 05:02	
Toluene-d8	109	87-121	4/13/11 05:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002C-038.5-20110407
 Lab Code: R1101876-005

Service Request: R1101876
 Date Collected: 4/7/11 1152
 Date Received: 4/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	200	500	NA	4/13/11 17:48		242280	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/13/11 17:48		242280	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/13/11 17:48		242280	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/13/11 17:48		242280	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/13/11 17:48		242280	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/13/11 17:48		242280	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/13/11 17:48		242280	
n-Butanol	25000	U	25000	3400	500	NA	4/13/11 17:48		242280	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/13/11 17:48		242280	
2-Hexanone	5000	U	5000	200	500	NA	4/13/11 17:48		242280	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/13/11 17:48		242280	
Acetone	10000	U	10000	800	500	NA	4/13/11 17:48		242280	
Benzene	2500	U	2500	160	500	NA	4/13/11 17:48		242280	
Bromodichloromethane	2500	U	2500	210	500	NA	4/13/11 17:48		242280	
Bromoform	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Bromomethane	2500	U	2500	200	500	NA	4/13/11 17:48		242280	
Carbon Disulfide	5000	U	5000	180	500	NA	4/13/11 17:48		242280	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/13/11 17:48		242280	
Chlorobenzene	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Chloroethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Chloroform	670	J	2500	150	500	NA	4/13/11 17:48		242280	
Chloromethane	2500	U	2500	230	500	NA	4/13/11 17:48		242280	
Cyclohexane	5000	U	5000	150	500	NA	4/13/11 17:48		242280	
Dibromochloromethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/13/11 17:48		242280	
Dichloromethane	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Ethylbenzene	2500	U	2500	210	500	NA	4/13/11 17:48		242280	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/13/11 17:48		242280	
Methyl Acetate	5000	U	5000	330	500	NA	4/13/11 17:48		242280	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110407
Lab Code: R1101876-005

Service Request: R1101876
Date Collected: 4/ 7/11 1152
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Methylcyclohexane	5000	U	5000	150	500	NA	4/13/11 17:48		242280	
Styrene	2500	U	2500	180	500	NA	4/13/11 17:48		242280	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/13/11 17:48		242280	
Toluene	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Trichloroethene (TCE)	3000		2500	150	500	NA	4/13/11 17:48		242280	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
Vinyl Chloride	2300	J	2500	150	500	NA	4/13/11 17:48		242280	
cis-1,2-Dichloroethene	79000		2500	150	500	NA	4/13/11 17:48		242280	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
m,p-Xylenes	2500	U	2500	410	500	NA	4/13/11 17:48		242280	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/13/11 17:48		242280	
o-Xylene	2500	U	2500	200	500	NA	4/13/11 17:48		242280	
trans-1,2-Dichloroethene	450	J	2500	150	500	NA	4/13/11 17:48		242280	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/13/11 17:48		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/13/11 17:48	
Dibromofluoromethane	106	89-119	4/13/11 17:48	
Toluene-d8	110	87-121	4/13/11 17:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110407
 Lab Code: R1101876-006

Service Request: R1101876
 Date Collected: 4/7/11 1404
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,1,2,2-Tetrachloroethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,1,2-Trichloroethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	20	50	NA	4/13/11 18:18		242280	
1,1-Dichloroethane (1,1-DCA)	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,1-Dichloroethene (1,1-DCE)	250	U	250	19	50	NA	4/13/11 18:18		242280	
1,2,4-Trichlorobenzene	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	50	NA	4/13/11 18:18		242280	
1,2-Dibromoethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,2-Dichlorobenzene	250	U	250	20	50	NA	4/13/11 18:18		242280	
1,2-Dichloroethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
1,2-Dichloropropane	250	U	250	33	50	NA	4/13/11 18:18		242280	
1,3-Dichlorobenzene	250	U	250	18	50	NA	4/13/11 18:18		242280	
1,4-Dichlorobenzene	250	U	250	17	50	NA	4/13/11 18:18		242280	
n-Butanol	2500	U	2500	340	50	NA	4/13/11 18:18		242280	
2-Butanone (MEK)	500	U	500	50	50	NA	4/13/11 18:18		242280	
2-Hexanone	500	U	500	20	50	NA	4/13/11 18:18		242280	
4-Methyl-2-pentanone	500	U	500	17	50	NA	4/13/11 18:18		242280	
Acetone	1000	U	1000	80	50	NA	4/13/11 18:18		242280	
Benzene	250	U	250	16	50	NA	4/13/11 18:18		242280	
Bromodichloromethane	250	U	250	21	50	NA	4/13/11 18:18		242280	
Bromoform	250	U	250	15	50	NA	4/13/11 18:18		242280	
Bromomethane	250	U	250	20	50	NA	4/13/11 18:18		242280	
Carbon Disulfide	500	U	500	18	50	NA	4/13/11 18:18		242280	
Carbon Tetrachloride	250	U	250	18	50	NA	4/13/11 18:18		242280	
Chlorobenzene	250	U	250	15	50	NA	4/13/11 18:18		242280	
Chloroethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
Chloroform	250	U	250	15	50	NA	4/13/11 18:18		242280	
Chloromethane	250	U	250	23	50	NA	4/13/11 18:18		242280	
Cyclohexane	500	U	500	15	50	NA	4/13/11 18:18		242280	
Dibromochloromethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
Dichlorodifluoromethane (CFC 12)	250	U	250	37	50	NA	4/13/11 18:18		242280	
Dichloromethane	250	U	250	15	50	NA	4/13/11 18:18		242280	
Ethylbenzene	250	U	250	21	50	NA	4/13/11 18:18		242280	
Isopropylbenzene (Cumene)	250	U	250	17	50	NA	4/13/11 18:18		242280	
Methyl Acetate	500	U	500	33	50	NA	4/13/11 18:18		242280	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110407
Lab Code: R1101876-006

Service Request: R1101876
Date Collected: 4/7/11 1404
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	4/13/11 18:18		242280	
Methylcyclohexane	500	U	500	15	50	NA	4/13/11 18:18		242280	
Styrene	250	U	250	18	50	NA	4/13/11 18:18		242280	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	4/13/11 18:18		242280	
Toluene	250	U	250	15	50	NA	4/13/11 18:18		242280	
Trichloroethene (TCE)	32	J	250	15	50	NA	4/13/11 18:18		242280	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	4/13/11 18:18		242280	
Vinyl Chloride	4700		250	15	50	NA	4/13/11 18:18		242280	
cis-1,2-Dichloroethene	9800		250	15	50	NA	4/13/11 18:18		242280	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	4/13/11 18:18		242280	
m,p-Xylenes	250	U	250	41	50	NA	4/13/11 18:18		242280	
n-Butyl Acetate	250	U	250	15	50	NA	4/13/11 18:18		242280	
o-Xylene	250	U	250	20	50	NA	4/13/11 18:18		242280	
trans-1,2-Dichloroethene	150	J	250	15	50	NA	4/13/11 18:18		242280	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	4/13/11 18:18		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 18:18	
Dibromofluoromethane	104	89-119	4/13/11 18:18	
Toluene-d8	109	87-121	4/13/11 18:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110407
Lab Code: R1101876-007

Service Request: R1101876
Date Collected: 4/ 7/11 0916
Date Received: 4/ 8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.4	mg/L	1.0	10	NA	4/11/11 16:03	
Carbon, Total Organic (TOC), Average	9060	3.5	mg/L	1.0	1	NA	4/17/11 13:52	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 14:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110407
 Lab Code: R1101876-007

Service Request: R1101876
 Date Collected: 4/7/11 0916
 Date Received: 4/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,1,2,2-Tetrachloroethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,1,2-Trichloroethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	140		25	2.0	5	NA	4/13/11 18:49		242280	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,1-Dichloroethene (1,1-DCE)	25	U	25	1.9	5	NA	4/13/11 18:49		242280	
1,2,4-Trichlorobenzene	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	2.2	5	NA	4/13/11 18:49		242280	
1,2-Dibromoethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,2-Dichlorobenzene	25	U	25	2.0	5	NA	4/13/11 18:49		242280	
1,2-Dichloroethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
1,2-Dichloropropane	25	U	25	3.4	5	NA	4/13/11 18:49		242280	
1,3-Dichlorobenzene	25	U	25	1.8	5	NA	4/13/11 18:49		242280	
1,4-Dichlorobenzene	25	U	25	1.8	5	NA	4/13/11 18:49		242280	
n-Butanol	250	U	250	34	5	NA	4/13/11 18:49		242280	
2-Butanone (MEK)	50	U	50	5.0	5	NA	4/13/11 18:49		242280	
2-Hexanone	50	U	50	2.0	5	NA	4/13/11 18:49		242280	
4-Methyl-2-pentanone	50	U	50	1.8	5	NA	4/13/11 18:49		242280	
Acetone	100	U	100	8.0	5	NA	4/13/11 18:49		242280	
Benzene	25	U	25	1.6	5	NA	4/13/11 18:49		242280	
Bromodichloromethane	25	U	25	2.1	5	NA	4/13/11 18:49		242280	
Bromoform	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Bromomethane	25	U	25	2.0	5	NA	4/13/11 18:49		242280	
Carbon Disulfide	50	U	50	1.8	5	NA	4/13/11 18:49		242280	
Carbon Tetrachloride	25	U	25	1.8	5	NA	4/13/11 18:49		242280	
Chlorobenzene	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Chloroethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Chloroform	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Chloromethane	25	U	25	2.4	5	NA	4/13/11 18:49		242280	
Cyclohexane	50	U	50	1.5	5	NA	4/13/11 18:49		242280	
Dibromochloromethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Dichlorodifluoromethane (CFC 12)	25	U	25	3.7	5	NA	4/13/11 18:49		242280	
Dichloromethane	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Ethylbenzene	25	U	25	2.1	5	NA	4/13/11 18:49		242280	
Isopropylbenzene (Cumene)	25	U	25	1.8	5	NA	4/13/11 18:49		242280	
Methyl Acetate	50	U	50	3.4	5	NA	4/13/11 18:49		242280	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110407
Lab Code: R1101876-007

Service Request: R1101876
Date Collected: 4/7/11 0916
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Methylcyclohexane	50	U	50	1.5	5	NA	4/13/11 18:49		242280	
Styrene	25	U	25	1.8	5	NA	4/13/11 18:49		242280	
Tetrachloroethene (PCE)	25	U	25	2.1	5	NA	4/13/11 18:49		242280	
Toluene	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Trichloroethene (TCE)	790		25	1.5	5	NA	4/13/11 18:49		242280	
Trichlorofluoromethane (CFC 11)	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
Vinyl Chloride	13	J	25	1.5	5	NA	4/13/11 18:49		242280	
cis-1,2-Dichloroethene	360		25	1.5	5	NA	4/13/11 18:49		242280	
cis-1,3-Dichloropropene	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
m,p-Xylenes	25	U	25	4.1	5	NA	4/13/11 18:49		242280	
n-Butyl Acetate	25	U	25	1.5	5	NA	4/13/11 18:49		242280	
o-Xylene	25	U	25	2.0	5	NA	4/13/11 18:49		242280	
trans-1,2-Dichloroethene	1.9	J	25	1.5	5	NA	4/13/11 18:49		242280	
trans-1,3-Dichloropropene	25	U	25	1.5	5	NA	4/13/11 18:49		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 18:49	
Dibromofluoromethane	106	89-119	4/13/11 18:49	
Toluene-d8	109	87-121	4/13/11 18:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Collected: 4/ 7/11 0916
Date Received: 4/ 8/11
Date Analyzed: 4/11/11 21:52

Sample Name: LC34-RW0008-052.0-20110407
Lab Code: R1101876-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\041111\X0005674.D\

Analysis Lot: 241933
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20110407
 Lab Code: R1101876-008

Service Request: R1101876
 Date Collected: 4/7/11 1029
 Date Received: 4/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,1,2,2-Tetrachloroethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,1,2-Trichloroethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.2	J	13	1.0	2.5	NA	4/13/11 07:02		242051	
1,1-Dichloroethane (1,1-DCA)	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,1-Dichloroethene (1,1-DCE)	13	U	13	0.93	2.5	NA	4/13/11 07:02		242051	
1,2,4-Trichlorobenzene	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.1	2.5	NA	4/13/11 07:02		242051	
1,2-Dibromoethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,2-Dichlorobenzene	13	U	13	1.0	2.5	NA	4/13/11 07:02		242051	
1,2-Dichloroethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
1,2-Dichloropropane	13	U	13	1.7	2.5	NA	4/13/11 07:02		242051	
1,3-Dichlorobenzene	13	U	13	0.90	2.5	NA	4/13/11 07:02		242051	
1,4-Dichlorobenzene	13	U	13	0.86	2.5	NA	4/13/11 07:02		242051	
n-Butanol	130	U	130	17	2.5	NA	4/13/11 07:02		242051	
2-Butanone (MEK)	25	U	25	2.5	2.5	NA	4/13/11 07:02		242051	
2-Hexanone	25	U	25	1.0	2.5	NA	4/13/11 07:02		242051	
4-Methyl-2-pentanone	25	U	25	0.86	2.5	NA	4/13/11 07:02		242051	
Acetone	50	U	50	4.0	2.5	NA	4/13/11 07:02		242051	
Benzene	13	U	13	0.78	2.5	NA	4/13/11 07:02		242051	
Bromodichloromethane	13	U	13	1.1	2.5	NA	4/13/11 07:02		242051	
Bromoform	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Bromomethane	13	U	13	1.0	2.5	NA	4/13/11 07:02		242051	
Carbon Disulfide	25	U	25	0.88	2.5	NA	4/13/11 07:02		242051	
Carbon Tetrachloride	13	U	13	0.90	2.5	NA	4/13/11 07:02		242051	
Chlorobenzene	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Chloroethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Chloroform	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Chloromethane	13	U	13	1.2	2.5	NA	4/13/11 07:02		242051	
Cyclohexane	25	U	25	0.75	2.5	NA	4/13/11 07:02		242051	
Dibromochloromethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Dichlorodifluoromethane (CFC 12)	13	U	13	1.9	2.5	NA	4/13/11 07:02		242051	
Dichloromethane	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Ethylbenzene	13	U	13	1.1	2.5	NA	4/13/11 07:02		242051	
Isopropylbenzene (Cumene)	13	U	13	0.86	2.5	NA	4/13/11 07:02		242051	
Methyl Acetate	25	U	25	1.7	2.5	NA	4/13/11 07:02		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110407
Lab Code: R1101876-008

Service Request: R1101876
Date Collected: 4/ 7/11 1029
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Methylcyclohexane	25	U	25	0.75	2.5	NA	4/13/11 07:02		242051	
Styrene	13	U	13	0.88	2.5	NA	4/13/11 07:02		242051	
Tetrachloroethene (PCE)	13	U	13	1.1	2.5	NA	4/13/11 07:02		242051	
Toluene	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Trichloroethene (TCE)	59		13	0.75	2.5	NA	4/13/11 07:02		242051	
Trichlorofluoromethane (CFC 11)	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
Vinyl Chloride	3.5	J	13	0.75	2.5	NA	4/13/11 07:02		242051	
cis-1,2-Dichloroethene	770	D	25	1.5	5	NA	4/13/11 19:19		242280	
cis-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
m,p-Xylenes	13	U	13	2.1	2.5	NA	4/13/11 07:02		242051	
n-Butyl Acetate	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	
o-Xylene	13	U	13	1.0	2.5	NA	4/13/11 07:02		242051	
trans-1,2-Dichloroethene	5.7	J	13	0.75	2.5	NA	4/13/11 07:02		242051	
trans-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/13/11 07:02		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/13/11 07:02	
Dibromofluoromethane	106	89-119	4/13/11 07:02	
Toluene-d8	109	87-121	4/13/11 07:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20110407
 Lab Code: R1101876-009

Service Request: R1101876
 Date Collected: 4/7/11 1336
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,1,2,2-Tetrachloroethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,1,2-Trichloroethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	J	13	1.0	2.5	NA	4/13/11 19:49		242280	
1,1-Dichloroethane (1,1-DCA)	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,1-Dichloroethene (1,1-DCE)	13	U	13	0.93	2.5	NA	4/13/11 19:49		242280	
1,2,4-Trichlorobenzene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.1	2.5	NA	4/13/11 19:49		242280	
1,2-Dibromoethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,2-Dichlorobenzene	13	U	13	1.0	2.5	NA	4/13/11 19:49		242280	
1,2-Dichloroethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
1,2-Dichloropropane	13	U	13	1.7	2.5	NA	4/13/11 19:49		242280	
1,3-Dichlorobenzene	13	U	13	0.90	2.5	NA	4/13/11 19:49		242280	
1,4-Dichlorobenzene	13	U	13	0.86	2.5	NA	4/13/11 19:49		242280	
n-Butanol	130	U	130	17	2.5	NA	4/13/11 19:49		242280	
2-Butanone (MEK)	25	U	25	2.5	2.5	NA	4/13/11 19:49		242280	
2-Hexanone	25	U	25	1.0	2.5	NA	4/13/11 19:49		242280	
4-Methyl-2-pentanone	25	U	25	0.86	2.5	NA	4/13/11 19:49		242280	
Acetone	50	U	50	4.0	2.5	NA	4/13/11 19:49		242280	
Benzene	13	U	13	0.78	2.5	NA	4/13/11 19:49		242280	
Bromodichloromethane	13	U	13	1.1	2.5	NA	4/13/11 19:49		242280	
Bromoform	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Bromomethane	13	U	13	1.0	2.5	NA	4/13/11 19:49		242280	
Carbon Disulfide	25	U	25	0.88	2.5	NA	4/13/11 19:49		242280	
Carbon Tetrachloride	13	U	13	0.90	2.5	NA	4/13/11 19:49		242280	
Chlorobenzene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Chloroethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Chloroform	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Chloromethane	13	U	13	1.2	2.5	NA	4/13/11 19:49		242280	
Cyclohexane	25	U	25	0.75	2.5	NA	4/13/11 19:49		242280	
Dibromochloromethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Dichlorodifluoromethane (CFC 12)	13	U	13	1.9	2.5	NA	4/13/11 19:49		242280	
Dichloromethane	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Ethylbenzene	13	U	13	1.1	2.5	NA	4/13/11 19:49		242280	
Isopropylbenzene (Cumene)	13	U	13	0.86	2.5	NA	4/13/11 19:49		242280	
Methyl Acetate	25	U	25	1.7	2.5	NA	4/13/11 19:49		242280	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110407
Lab Code: R1101876-009

Service Request: R1101876
Date Collected: 4/ 7/11 1336
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Methylcyclohexane	25	U	25	0.75	2.5	NA	4/13/11 19:49		242280	
Styrene	13	U	13	0.88	2.5	NA	4/13/11 19:49		242280	
Tetrachloroethene (PCE)	13	U	13	1.1	2.5	NA	4/13/11 19:49		242280	
Toluene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Trichloroethene (TCE)	380		13	0.75	2.5	NA	4/13/11 19:49		242280	
Trichlorofluoromethane (CFC 11)	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
Vinyl Chloride	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
cis-1,2-Dichloroethene	60		13	0.75	2.5	NA	4/13/11 19:49		242280	
cis-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
m,p-Xylenes	13	U	13	2.1	2.5	NA	4/13/11 19:49		242280	
n-Butyl Acetate	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
o-Xylene	13	U	13	1.0	2.5	NA	4/13/11 19:49		242280	
trans-1,2-Dichloroethene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	
trans-1,3-Dichloropropene	13	U	13	0.75	2.5	NA	4/13/11 19:49		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 19:49	
Dibromofluoromethane	105	89-119	4/13/11 19:49	
Toluene-d8	109	87-121	4/13/11 19:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003E-052.5-20110407
 Lab Code: R1101876-010

Service Request: R1101876
 Date Collected: 4/7/11 1429
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/13/11 03:01		242051	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 03:01		242051	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 03:01		242051	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 03:01		242051	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 03:01		242051	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 03:01		242051	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 03:01		242051	
n-Butanol	50	U	50	6.7	1	NA	4/13/11 03:01		242051	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 03:01		242051	
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 03:01		242051	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 03:01		242051	
Acetone	20	U	20	1.6	1	NA	4/13/11 03:01		242051	
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 03:01		242051	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 03:01		242051	
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 03:01		242051	
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 03:01		242051	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 03:01		242051	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 03:01		242051	
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 03:01		242051	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 03:01		242051	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 03:01		242051	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 03:01		242051	
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 03:01		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110407
Lab Code: R1101876-010

Service Request: R1101876
Date Collected: 4/ 7/11 1429
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 03:01		242051	
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 03:01		242051	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 03:01		242051	
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
cis-1,2-Dichloroethene	0.56	J	5.0	0.30	1	NA	4/13/11 03:01		242051	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 03:01		242051	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 03:01		242051	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 03:01		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 03:01	
Dibromofluoromethane	107	89-119	4/13/11 03:01	
Toluene-d8	109	87-121	4/13/11 03:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0001-000.0-20110401
 Lab Code: R1101876-011

Service Request: R1101876
 Date Collected: 4/ 1/11 1450
 Date Received: 4/ 8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,1,2-Trichloro-1,2,2-trifluoroethane	0.61	J	5.0	0.40	1	NA	4/13/11 01:00		242051	*
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 01:00		242051	*
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 01:00		242051	*
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 01:00		242051	*
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 01:00		242051	*
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 01:00		242051	*
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 01:00		242051	*
n-Butanol	50	U	50	6.7	1	NA	4/13/11 01:00		242051	*
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 01:00		242051	*
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 01:00		242051	*
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 01:00		242051	*
Acetone	20	U	20	1.6	1	NA	4/13/11 01:00		242051	*
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 01:00		242051	*
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 01:00		242051	*
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 01:00		242051	*
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 01:00		242051	*
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 01:00		242051	*
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 01:00		242051	*
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 01:00		242051	*
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 01:00		242051	*
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 01:00		242051	*
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 01:00		242051	*
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 01:00		242051	*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0001-000.0-20110401
Lab Code: R1101876-011

Service Request: R1101876
Date Collected: 4/ 1/11 1450
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 01:00		242051	*
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 01:00		242051	*
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 01:00		242051	*
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 01:00		242051	*
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 01:00		242051	*
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 01:00		242051	*

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/13/11 01:00	
Dibromofluoromethane	105	89-119	4/13/11 01:00	
Toluene-d8	110	87-121	4/13/11 01:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0002-000.0-20110401
Lab Code: R1101876-012

Service Request: R1101876
Date Collected: 4/ 1/11 1450
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/13/11 01:30		242051	*
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 01:30		242051	*
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 01:30		242051	*
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 01:30		242051	*
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 01:30		242051	*
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 01:30		242051	*
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 01:30		242051	*
n-Butanol	50	U	50	6.7	1	NA	4/13/11 01:30		242051	*
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 01:30		242051	*
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 01:30		242051	*
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 01:30		242051	*
Acetone	2.8	J	20	1.6	1	NA	4/13/11 01:30		242051	*
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 01:30		242051	*
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 01:30		242051	*
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 01:30		242051	*
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 01:30		242051	*
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 01:30		242051	*
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 01:30		242051	*
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 01:30		242051	*
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 01:30		242051	*
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 01:30		242051	*
Isopropylbenzene (Cumene)	4.3	J	5.0	0.34	1	NA	4/13/11 01:30		242051	*
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 01:30		242051	*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0002-000.0-20110401
 Lab Code: R1101876-012

Service Request: R1101876
 Date Collected: 4/ 1/11 1450
 Date Received: 4/ 8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 01:30		242051	*
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 01:30		242051	*
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 01:30		242051	*
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 01:30		242051	*
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 01:30		242051	*
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 01:30		242051	*

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 01:30	
Dibromofluoromethane	105	89-119	4/13/11 01:30	
Toluene-d8	109	87-121	4/13/11 01:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0003-000.0-20110407
 Lab Code: R1101876-013

Service Request: R1101876
 Date Collected: 4/7/11 1205
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.60	J	5.0	0.40	1	NA	4/13/11 02:01		242051	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 02:01		242051	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 02:01		242051	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 02:01		242051	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 02:01		242051	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 02:01		242051	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 02:01		242051	
n-Butanol	50	U	50	6.7	1	NA	4/13/11 02:01		242051	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 02:01		242051	
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 02:01		242051	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 02:01		242051	
Acetone	20	U	20	1.6	1	NA	4/13/11 02:01		242051	
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 02:01		242051	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 02:01		242051	
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 02:01		242051	
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 02:01		242051	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 02:01		242051	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 02:01		242051	
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 02:01		242051	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 02:01		242051	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 02:01		242051	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 02:01		242051	
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 02:01		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0003-000.0-20110407
Lab Code: R1101876-013

Service Request: R1101876
Date Collected: 4/7/11 1205
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 02:01		242051	
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 02:01		242051	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 02:01		242051	
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 02:01		242051	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 02:01		242051	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 02:01		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/13/11 02:01	
Dibromofluoromethane	105	89-119	4/13/11 02:01	
Toluene-d8	108	87-121	4/13/11 02:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0004-000.0-20110407
 Lab Code: R1101876-014

Service Request: R1101876
 Date Collected: 4/7/11 1205
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/13/11 02:31		242051	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 02:31		242051	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 02:31		242051	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 02:31		242051	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 02:31		242051	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 02:31		242051	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 02:31		242051	
n-Butanol	50	U	50	6.7	1	NA	4/13/11 02:31		242051	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 02:31		242051	
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 02:31		242051	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 02:31		242051	
Acetone	20	U	20	1.6	1	NA	4/13/11 02:31		242051	
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 02:31		242051	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 02:31		242051	
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 02:31		242051	
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 02:31		242051	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 02:31		242051	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 02:31		242051	
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 02:31		242051	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 02:31		242051	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 02:31		242051	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 02:31		242051	
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 02:31		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0004-000.0-20110407
 Lab Code: R1101876-014

Service Request: R1101876
 Date Collected: 4/ 7/11 1205
 Date Received: 4/ 8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 02:31		242051	
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 02:31		242051	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 02:31		242051	
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 02:31		242051	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 02:31		242051	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 02:31		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 02:31	
Dibromofluoromethane	106	89-119	4/13/11 02:31	
Toluene-d8	110	87-121	4/13/11 02:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110407
Lab Code: R1101876-015

Service Request: R1101876
Date Collected: 4/ 7/11
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/13/11 00:30		242051	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 00:30		242051	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 00:30		242051	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 00:30		242051	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 00:30		242051	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 00:30		242051	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 00:30		242051	
n-Butanol	50	U	50	6.7	1	NA	4/13/11 00:30		242051	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 00:30		242051	
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 00:30		242051	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 00:30		242051	
Acetone	20	U	20	1.6	1	NA	4/13/11 00:30		242051	
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 00:30		242051	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 00:30		242051	
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 00:30		242051	
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 00:30		242051	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 00:30		242051	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 00:30		242051	
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 00:30		242051	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 00:30		242051	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 00:30		242051	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 00:30		242051	
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 00:30		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110407
Lab Code: R1101876-015

Service Request: R1101876
Date Collected: 4/ 7/11
Date Received: 4/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 00:30		242051	
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 00:30		242051	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 00:30		242051	
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 00:30		242051	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 00:30		242051	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 00:30		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 00:30	
Dibromofluoromethane	104	89-119	4/13/11 00:30	
Toluene-d8	109	87-121	4/13/11 00:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110407-01
 Lab Code: R1101876-016

Service Request: R1101876
 Date Collected: 4/7/11
 Date Received: 4/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,1,2,2-Tetrachloroethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,1,2-Trichloroethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000	D	1300	100	250	NA	4/13/11 08:03		242051	
1,1-Dichloroethane (1,1-DCA)	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,1-Dichloroethene (1,1-DCE)	250	U	250	19	50	NA	4/13/11 20:19		242280	
1,2,4-Trichlorobenzene	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	50	NA	4/13/11 20:19		242280	
1,2-Dibromoethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,2-Dichlorobenzene	250	U	250	20	50	NA	4/13/11 20:19		242280	
1,2-Dichloroethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
1,2-Dichloropropane	250	U	250	33	50	NA	4/13/11 20:19		242280	
1,3-Dichlorobenzene	250	U	250	18	50	NA	4/13/11 20:19		242280	
1,4-Dichlorobenzene	250	U	250	17	50	NA	4/13/11 20:19		242280	
n-Butanol	2500	U	2500	340	50	NA	4/13/11 20:19		242280	
2-Butanone (MEK)	500	U	500	50	50	NA	4/13/11 20:19		242280	
2-Hexanone	500	U	500	20	50	NA	4/13/11 20:19		242280	
4-Methyl-2-pentanone	500	U	500	17	50	NA	4/13/11 20:19		242280	
Acetone	1000	U	1000	80	50	NA	4/13/11 20:19		242280	
Benzene	250	U	250	16	50	NA	4/13/11 20:19		242280	
Bromodichloromethane	250	U	250	21	50	NA	4/13/11 20:19		242280	
Bromoform	250	U	250	15	50	NA	4/13/11 20:19		242280	
Bromomethane	250	U	250	20	50	NA	4/13/11 20:19		242280	
Carbon Disulfide	500	U	500	18	50	NA	4/13/11 20:19		242280	
Carbon Tetrachloride	250	U	250	18	50	NA	4/13/11 20:19		242280	
Chlorobenzene	250	U	250	15	50	NA	4/13/11 20:19		242280	
Chloroethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
Chloroform	250	U	250	15	50	NA	4/13/11 20:19		242280	
Chloromethane	250	U	250	23	50	NA	4/13/11 20:19		242280	
Cyclohexane	500	U	500	15	50	NA	4/13/11 20:19		242280	
Dibromochloromethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
Dichlorodifluoromethane (CFC 12)	250	U	250	37	50	NA	4/13/11 20:19		242280	
Dichloromethane	250	U	250	15	50	NA	4/13/11 20:19		242280	
Ethylbenzene	250	U	250	21	50	NA	4/13/11 20:19		242280	
Isopropylbenzene (Cumene)	250	U	250	17	50	NA	4/13/11 20:19		242280	
Methyl Acetate	500	U	500	33	50	NA	4/13/11 20:19		242280	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110407-01
Lab Code: R1101876-016

Service Request: R1101876
Date Collected: 4/7/11
Date Received: 4/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	4/13/11 20:19		242280	
Methylcyclohexane	500	U	500	15	50	NA	4/13/11 20:19		242280	
Styrene	250	U	250	18	50	NA	4/13/11 20:19		242280	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	4/13/11 20:19		242280	
Toluene	250	U	250	15	50	NA	4/13/11 20:19		242280	
Trichloroethene (TCE)	350		250	15	50	NA	4/13/11 20:19		242280	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	4/13/11 20:19		242280	
Vinyl Chloride	810		250	15	50	NA	4/13/11 20:19		242280	
cis-1,2-Dichloroethene	25000	D	1300	75	250	NA	4/13/11 08:03		242051	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	4/13/11 20:19		242280	
m,p-Xylenes	250	U	250	41	50	NA	4/13/11 20:19		242280	
n-Butyl Acetate	250	U	250	15	50	NA	4/13/11 20:19		242280	
o-Xylene	250	U	250	20	50	NA	4/13/11 20:19		242280	
trans-1,2-Dichloroethene	380		250	15	50	NA	4/13/11 20:19		242280	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	4/13/11 20:19		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/13/11 20:19	
Dibromofluoromethane	105	89-119	4/13/11 20:19	
Toluene-d8	111	87-121	4/13/11 20:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1101876-MB

Service Request: R1101876
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	4/11/11 12:00	
Carbon, Total Organic (TOC), Average	9060	1.0 U	mg/L	1.0	1	NA	4/17/11 04:26	
Iodide	300.0	0.20 U	mg/L	0.20	1	NA	5/3/11 13:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103183-04

Service Request: R1101876
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/12/11 23:59		242051	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/12/11 23:59		242051	
1,2,4-Trichlorobenzene	0.31	J	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/12/11 23:59		242051	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/12/11 23:59		242051	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/12/11 23:59		242051	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/12/11 23:59		242051	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/12/11 23:59		242051	
n-Butanol	50	U	50	6.7	1	NA	4/12/11 23:59		242051	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/12/11 23:59		242051	
2-Hexanone	10	U	10	0.40	1	NA	4/12/11 23:59		242051	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/12/11 23:59		242051	
Acetone	20	U	20	1.6	1	NA	4/12/11 23:59		242051	
Benzene	5.0	U	5.0	0.31	1	NA	4/12/11 23:59		242051	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/12/11 23:59		242051	
Bromoform	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/12/11 23:59		242051	
Carbon Disulfide	10	U	10	0.35	1	NA	4/12/11 23:59		242051	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/12/11 23:59		242051	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Chloroform	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/12/11 23:59		242051	
Cyclohexane	10	U	10	0.30	1	NA	4/12/11 23:59		242051	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/12/11 23:59		242051	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/12/11 23:59		242051	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/12/11 23:59		242051	
Methyl Acetate	10	U	10	0.66	1	NA	4/12/11 23:59		242051	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103183-04

Service Request: R1101876
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242051

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Methylcyclohexane	10	U	10	0.30	1	NA	4/12/11 23:59		242051	
Styrene	5.0	U	5.0	0.35	1	NA	4/12/11 23:59		242051	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/12/11 23:59		242051	
Toluene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/12/11 23:59		242051	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/12/11 23:59		242051	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/12/11 23:59		242051	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/12/11 23:59	
Dibromofluoromethane	106	89-119	4/12/11 23:59	
Toluene-d8	109	87-121	4/12/11 23:59	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103186-04

Service Request: R1101876
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/13/11 12:16		242280	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/13/11 12:16		242280	
1,2,4-Trichlorobenzene	0.33	J	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/13/11 12:16		242280	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/13/11 12:16		242280	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/13/11 12:16		242280	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/13/11 12:16		242280	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/13/11 12:16		242280	
n-Butanol	50	U	50	6.7	1	NA	4/13/11 12:16		242280	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/13/11 12:16		242280	
2-Hexanone	10	U	10	0.40	1	NA	4/13/11 12:16		242280	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/13/11 12:16		242280	
Acetone	20	U	20	1.6	1	NA	4/13/11 12:16		242280	
Benzene	5.0	U	5.0	0.31	1	NA	4/13/11 12:16		242280	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/13/11 12:16		242280	
Bromoform	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/13/11 12:16		242280	
Carbon Disulfide	10	U	10	0.35	1	NA	4/13/11 12:16		242280	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/13/11 12:16		242280	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Chloroform	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/13/11 12:16		242280	
Cyclohexane	10	U	10	0.30	1	NA	4/13/11 12:16		242280	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/13/11 12:16		242280	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/13/11 12:16		242280	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/13/11 12:16		242280	
Methyl Acetate	10	U	10	0.66	1	NA	4/13/11 12:16		242280	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103186-04

Service Request: R1101876
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 242280

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Methylcyclohexane	10	U	10	0.30	1	NA	4/13/11 12:16		242280	
Styrene	5.0	U	5.0	0.35	1	NA	4/13/11 12:16		242280	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/13/11 12:16		242280	
Toluene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/13/11 12:16		242280	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/13/11 12:16		242280	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/13/11 12:16		242280	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/13/11 12:16	
Dibromofluoromethane	105	89-119	4/13/11 12:16	
Toluene-d8	108	87-121	4/13/11 12:16	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Collected: NA
Date Received: NA
Date Analyzed: 4/11/11 11:35

Sample Name: Method Blank
Lab Code: RQ1103055-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\041111\X0005664.D\

Analysis Lot: 241933
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Analyzed: 4/11/11 -
5/ 3/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1101876-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.02	1.00	102	90 - 110
Iodide	300.0	0.935	1.00	94	90 - 110
Carbon, Total Organic (TOC), Average	9060	9.87	10.0	99	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1101876
 Date Analyzed: 4/12/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 242051

Lab Control Sample
 RQ1103183-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.4	20.0	92	72 - 128
1,1,2,2-Tetrachloroethane	18.7	20.0	94	72 - 131
1,1,2-Trichloroethane	19.8	20.0	99	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.6	20.0	88	71 - 134
1,1-Dichloroethane (1,1-DCA)	19.3	20.0	96	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.2	20.0	86	72 - 129
1,2,4-Trichlorobenzene	20.2	20.0	101	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.4	20.0	92	62 - 131
1,2-Dibromoethane	19.4	20.0	97	78 - 125
1,2-Dichlorobenzene	19.4	20.0	97	79 - 124
1,2-Dichloroethane	20.5	20.0	103	78 - 126
1,2-Dichloropropane	19.3	20.0	96	80 - 123
1,3-Dichlorobenzene	18.9	20.0	94	78 - 124
1,4-Dichlorobenzene	18.9	20.0	94	78 - 123
n-Butanol	1030	1000	103	70 - 130
2-Butanone (MEK)	19.9	20.0	100	60 - 133
2-Hexanone	18.7	20.0	93	61 - 131
4-Methyl-2-pentanone	19.8	20.0	99	61 - 132
Acetone	19.4	20.0	97	59 - 140
Benzene	19.0	20.0	95	78 - 121
Bromodichloromethane	19.5	20.0	97	80 - 125
Bromoform	19.4	20.0	97	73 - 132
Bromomethane	16.4	20.0	82	57 - 144
Carbon Disulfide	17.7	20.0	89	59 - 138
Carbon Tetrachloride	18.1	20.0	90	69 - 135
Chlorobenzene	19.6	20.0	98	80 - 121
Chloroethane	20.5	20.0	102	71 - 130
Chloroform	18.9	20.0	94	78 - 125
Chloromethane	20.6	20.0	103	62 - 133
Cyclohexane	17.6	20.0	88	67 - 127
Dibromochloromethane	19.3	20.0	97	78 - 133
Dichlorodifluoromethane (CFC 12)	19.4	20.0	97	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Analyzed: 4/12/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 242051

**Lab Control Sample
 RQ1103183-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.3	20.0	91	75 - 125
Ethylbenzene	18.8	20.0	94	78 - 123
Isopropylbenzene (Cumene)	21.2	20.0	106	73 - 133
Methyl Acetate	20.4	20.0	102	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	17.7	20.0	88	64 - 133
Styrene	19.5	20.0	98	80 - 132
Tetrachloroethene (PCE)	18.6	20.0	93	72 - 131
Toluene	19.3	20.0	97	78 - 122
Trichloroethene (TCE)	18.8	20.0	94	74 - 127
Trichlorofluoromethane (CFC 11)	19.8	20.0	99	71 - 139
Vinyl Chloride	20.1	20.0	100	71 - 136
cis-1,2-Dichloroethene	18.9	20.0	95	78 - 122
cis-1,3-Dichloropropene	18.2	20.0	91	77 - 125
m,p-Xylenes	38.4	40.0	96	79 - 126
n-Butyl Acetate	20.4	20.0	102	54 - 127
o-Xylene	18.8	20.0	94	79 - 126
trans-1,2-Dichloroethene	17.3	20.0	87	75 - 121
trans-1,3-Dichloropropene	18.0	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Analyzed: 4/13/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 242280

**Lab Control Sample
 RQ1103186-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.0	20.0	100	72 - 128
1,1,2,2-Tetrachloroethane	20.5	20.0	102	72 - 131
1,1,2-Trichloroethane	21.1	20.0	106	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.1	20.0	96	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.7	20.0	104	76 - 122
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	93	72 - 129
1,2,4-Trichlorobenzene	21.9	20.0	110	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.1	20.0	90	62 - 131
1,2-Dibromoethane	20.7	20.0	104	78 - 125
1,2-Dichlorobenzene	20.6	20.0	103	79 - 124
1,2-Dichloroethane	21.6	20.0	108	78 - 126
1,2-Dichloropropane	21.1	20.0	105	80 - 123
1,3-Dichlorobenzene	20.7	20.0	104	78 - 124
1,4-Dichlorobenzene	20.2	20.0	101	78 - 123
n-Butanol	1030	1000	103	70 - 130
2-Butanone (MEK)	19.5	20.0	97	60 - 133
2-Hexanone	17.6	20.0	88	61 - 131
4-Methyl-2-pentanone	19.6	20.0	98	61 - 132
Acetone	18.4	20.0	92	59 - 140
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	20.9	20.0	104	80 - 125
Bromoform	20.2	20.0	101	73 - 132
Bromomethane	17.8	20.0	89	57 - 144
Carbon Disulfide	18.3	20.0	91	59 - 138
Carbon Tetrachloride	19.4	20.0	97	69 - 135
Chlorobenzene	21.0	20.0	105	80 - 121
Chloroethane	22.1	20.0	111	71 - 130
Chloroform	20.9	20.0	105	78 - 125
Chloromethane	21.7	20.0	109	62 - 133
Cyclohexane	16.7	20.0	84	67 - 127
Dibromochloromethane	20.8	20.0	104	78 - 133
Dichlorodifluoromethane (CFC 12)	21.1	20.0	105	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Analyzed: 4/13/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 242280

**Lab Control Sample
 RQ1103186-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.8	20.0	99	75 - 125
Ethylbenzene	20.0	20.0	100	78 - 123
Isopropylbenzene (Cumene)	23.2	20.0	116	73 - 133
Methyl Acetate	20.7	20.0	104	57 - 157
Methyl tert-Butyl Ether	20.7	20.0	104	75 - 126
Methylcyclohexane	16.7	20.0	83	64 - 133
Styrene	21.0	20.0	105	80 - 132
Tetrachloroethene (PCE)	20.1	20.0	101	72 - 131
Toluene	20.7	20.0	104	78 - 122
Trichloroethene (TCE)	19.6	20.0	98	74 - 127
Trichlorofluoromethane (CFC 11)	21.6	20.0	108	71 - 139
Vinyl Chloride	21.8	20.0	109	71 - 136
cis-1,2-Dichloroethene	21.0	20.0	105	78 - 122
cis-1,3-Dichloropropene	19.8	20.0	99	77 - 125
m,p-Xylenes	41.4	40.0	103	79 - 126
n-Butyl Acetate	20.3	20.0	102	54 - 127
o-Xylene	20.5	20.0	102	79 - 126
trans-1,2-Dichloroethene	19.1	20.0	96	75 - 121
trans-1,3-Dichloropropene	19.4	20.0	97	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1101876
Date Analyzed: 4/11/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 241933

Analyte Name	Lab Control Sample RQ1103055-02			Duplicate Lab Control Sample RQ1103055-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.02	0.998	102	1.01	0.998	101	70 - 130	<1	30
Acetic Acid	9.18	9.97	92	9.23	9.97	93	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.78	9.98	98	9.93	9.98	100	82 - 118	2	30
Lactic Acid	9.38	10.0	94	9.43	10.0	94	70 - 117	<1	30
Propionic Acid	9.70	9.97	97	10.0	9.97	100	80 - 125	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	VOCs (826C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	REMARKS
LC34-RW0007-038.5-20110407	04/07/11	0953	-001	GW	9	3	1	3					
LC34-IW0002I-027.5-20110407		1127	-002	GW	3	3							
LC34-IW0002D-037.5-20110407		1052	-003	GW	3	3							
LC34-BW0001C-038.5-20110407		1312	-004	GW	3	3							
LC34-BW0002C-038.5-20110407		1152	-005	GW	3	3							
LC34-BW0003C-038.5-20110407		1404	-006	GW	3	3							
LC34-RW0008-052.0-20110407	04/07/11	0916	-007	GW	9	3	2	1	3				
LC34-IW0002DI-052.5-20110407		1029	-008	GW	3	3							
LC34-BW0001E-052.5-20110407		1336	-009	GW	3	3							
LC34-BW0003E-052.5-20110407		1429	-010	GW	3	3							

Number of Containers: _____

Comments/Special Instructions: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD
 X ___ Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

Invoice Information
 P.O. # _____
 Bill to: TR0272

R1101876
 GeoSyntec Consultants
 ESTCP PED LC34 TR0272



RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Baret
 Firm: Geosyntec
 Date/Time: 04/07/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Amy Hentsche
 Firm: Geosyntec
 Date/Time: 04/07/11 - 1630

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (826C) plus n-butyl acetate	VFA's (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEAs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	REMARKS
LC34-PB-20110407-01	4/7/11	NA	NA	GW	3									
LC34-EF001-000.0-20110401	4/1/2011	1450	-011	GW	3									
LC34-EF002-000.0-20110401	4/1/2011	1450	-012	GW	3									
LC34-EF003-000.0-20110407	4/7/11	1205	-013	GW	3									
LC34-EF004-000.0-20110407	4/7/11	1205	-014	GW	3									
LC34-TB-20110407-01	4/7/11	NA	-015	GW	3									
LC34-P0-20110407-01	4/7/11	NA	-016	GW	3									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 sample Id LC34-TB-20110407s the trip blank - please use this sample ID

R1101876

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Jossep + BARETT
 Firm: Geosyntec
 Date/Time: 04/02/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Amy Hentschke
 Firm: CASJ
 Date/Time: 4/8/11 0918

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R1101876

Cooler received on 4/8/11 by: AHJ COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were **Ice** or **Ice packs** present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 4°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 4/8/11 0925

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 4/8/11

Cooler Breakdown: Date: 4/8/11 Time: 1348 by: AHJ

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC103001A 2/12</u>					
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-						
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: H₃PO₄-WC52115 exp 11/14
0-319-004, 031411-2K

Other Comments: _____
 PC Secondary Review: KB 5/6/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

May 12, 2011

Service Request No: R1102105

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory between April 19, 2011 and April 20, 2011. For your reference, these analyses have been assigned our service request number **R1102105**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1102105
Date Received: 4/19-20/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Fifty-two (52) water samples including three (3) Trip Blanks were collected by the client on 4/18-19/11 and were received for analysis at Columbia Analytical Services on 4/19-20/11 via a national courier. The samples were received at cooler temperatures ranging from 1-7°C on the 4/19/11 shipment and 2.8-3.6. Temperature guidelines are 0-6°C. The TOC's, VOC's and Metabolic Acids arrived on ice but slightly above guidelines (7°) in the 4/19/11 shipment due to insufficient ice in the cooler. Several sample ID's were changed as per instructions from client email of 4/21/11.

Headspace existed in 1 of 3 VOC vials for 3 locations, no data was affected. See Cooler Preservation Check Form for specific locations. Sulfide bottles had headspace for locations: BW0001D, BW0001B, BW0001C and IW0002I. The sample label for the 8260C location BW0001 (CAS R1102105-011) was determined to be "D" by process of elimination. Bromide and Iodide aliquot for BW002F was determined by process of elimination. The following locations had bubbles in VOC vials: BW002A (and RSK vials), BW002B, BW002D, BW002E, BW002F (and RSK vials), FD-20110419-10 and FD-02110419-01. Additionally BW002C and RD-2011-419-03 RSK vials had bubbles present. All vials were observed by the Project Manager on 4/21/11. Only 1 vial was affected for each sample. Bubbles ranged from 0.6 cm to 1.5 cm. Permission to analyze samples was given in client email from 4/20/11.

Locations BW002C and BW-3C (R1102105-039 and -046 respectively) were not noted for Sulfide and Anions on the chain. Aliquots were received for these locations. Analyses were conducted as per client email from 4/20/11.

Volatile Organic Compounds

Forty-two (42) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. Twenty-seven (27) waters samples were analyzed for GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples except the following: the minimum response factor for Carbon Tetrachloride was not met in the ICAL/Daily CCV from 4/21/11. The data has been considered reportable since the MRL has been verified by the low standard in the calibration. The Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Chloromethane on 4/23/11. All detected concentrations for this compound in samples associated with this CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK) recoveries were all within QC limits except for 8260C LCS for n-Butanol on 4/23/11 which was outside limits, high. The recovery is flagged as "**".

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All samples were initially analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of

Approved by Kevin Beerle Date 5/17/11

the sample. Location LC34-FD-20110419-10 (CAS Submission #R1102150-060) dilution was run on the 8th day from sample collection. The compound is flagged as “*”, outside of holding time.

The Laboratory Method Blanks were free from contamination except for low level hits between the MRL and MDL for the compound 1,2,4-Trichlorobenzene on the 4/25/11 and 4/26/11 analytical runs.

No other analytical or QC problems were encountered.

HPLC Methodology

Twenty-seven (27) water samples were analyzed for Organic Acids by HPLC.

All Initial and Continuing Calibration Criteria were met.

Batch QC is included in the report. All LCS and LCSD recoveries were within QC acceptance limits. All RPD calculations were acceptable.

All samples were analyzed within the proper holding time for the method.

The Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Inorganic Parameters

Thirty-three (33) water samples were analyzed for TOC by method 9060, 24 Bromide and Iodide by IC method 300.0, and 13 Sulfide by SM 4500-S2-F, Alkalinities by SM 2320 B and Anions: Chloride, Nitrate, Nitrite and Sulfate by IC method 300.0. The TOC Quad average has been reported.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met for these analyses except for 9 Nitrite samples which were repeated outside the 48 hour holding times due to interference from Chloride not noted on the initial runs. Samples were repeated as soon as possible after the interference was detected. All were re-analyzed less than 3 hours outside of the holding time.

All Laboratory Method Blanks were free from contamination.

Approved by Karen Bertha Date 5/17/11

CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1102105

<u>Lab ID</u>	<u>Client ID</u>
R1102105-001	LC34-IW0002I-027.5-20110418
R1102105-002	LC34-IW0002I-027.5-20110418 Dissolved
R1102105-003	LC34-IW0002D-037.5-20110418
R1102105-004	LC34-IW0002D-037.5-20110418 Dissolved
R1102105-005	LC34-BW0001A-024.5-20110418
R1102105-006	LC34-BW0001A-024.5-20110418 Dissolved
R1102105-007	LC34-BW0001B-031.5-20110418
R1102105-008	LC34-BW0001B-031.5-20110418 Dissolved
R1102105-009	LC34-BW0001C-038.5-20110418
R1102105-010	LC34-BW0001C-038.5-20110418 Dissolved
R1102105-011	LC34-BW0001D-045.5-20110418
R1102105-012	LC34-BW0001D-045.5-20110418 Dissolved
R1102105-013	LC34-IW0002D1-050.0-20110418
R1102105-014	LC34-IW0002D1-050.0-20110418 Dissolved
R1102105-015	LC34-BW0001E-052.5-20110418
R1102105-016	LC34-BW0001E-052.5-20110418 Dissolved
R1102105-017	LC34-BW0001F-059.5-20110418
R1102105-018	LC34-BW0001F-059.5-20110418 Dissolved
R1102105-019	LC34-IW0076-075.0-20110418
R1102105-020	LC34-IW0076-075.0-20110418 Dissolved
R1102105-021	LC34-IW0067D-040.5-20110418
R1102105-022	LC34-IW0067D1-068.0-20110418
R1102105-023	LC34-IW0070D-040.5-20110418
R1102105-024	LC34-IW0070D1-070.0-20110418
R1102105-025	LC34-IW0071D-040.5-20110418
R1102105-026	LC34-IW0071D1-070.0-20110418
R1102105-027	LC34-EF0005-000.0-20110418
R1102105-028	LC34-EF0006.000.0-20110418
R1102105-029	LC34-TB-20110418-01
R1102105-030	LC34-RW0007-038.5-20110419
R1102105-031	LC34-RW0007-038.5-20110419 Dissolved
R1102105-032	LC34-RW0007-038.5-20110419-D
R1102105-033	LC34-RW0007-038.5-20110419-D Dissolved
R1102105-034	LC34-RW0008-038.5-20110419
R1102105-035	LC34-RW0008-038.5-20110419 Dissolved
R1102105-036	LC34-RW0008-038.5-20110419-D
R1102105-037	LC34-BW0002A-024.5-20110419
R1102105-038	LC34-BW0002B-031.5-20110419
R1102105-039	LC34-BW0002C-038.5-20110419
R1102105-040	LC34-BW0002D-045.5-20110419
R1102105-041	LC34-BW0002E-052.5-20110419
R1102105-042	LC34-BW0002F-059.5-20110419
R1102105-043	LC34-BW0003A-024.5-20110419
R1102105-044	LC34-BW0003B-031.5-20110419

<u>Lab ID</u>	<u>Client ID</u>
R1102105-045	LC34-BW0003B-031.5-20110419-D
R1102105-046	LC34-BW0003C-038.5-20110419
R1102105-047	LC34-BW0003D-045.5-20110419
R1102105-048	LC34-BW0003D-D-045.5-20110419
R1102105-049	LC34-BW0003E-052.5-20110419
R1102105-050	LC34-BW0003F-059.5-20110419
R1102105-051	LC34-FD-20110419-01
R1102105-052	LC34-FD-20110419-02
R1102105-053	LC34-FD-20110419-03
R1102105-054	LC34-FD-20110419-04
R1102105-055	LC34-FD-20110419-05
R1102105-056	LC34-FD-20110419-06
R1102105-057	LC34-FD-20110419-07
R1102105-058	LC34-FD-20110419-08
R1102105-059	LC34-FD-20110419-09
R1102105-060	LC34-FD-20110419-10
R1102105-061	LC34-FD-20110419-11
R1102105-062	LC34-FD-20110419-12
R1102105-063	LC34-FD-20110419-13
R1102105-064	LC34-TB-20110419-01
R1102105-065	LC34-TB-20110419-02

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110418
Lab Code: R1102105-001

Service Request: R1102105
Date Collected: 4/18/11 1510
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	250		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:24	
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/29/11 17:47	
Chloride	300.0	73.1		mg/L	2.0	10	NA	4/19/11 20:24	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 14:57	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:24	
Nitrite as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:24	
Sulfate	300.0	51.4		mg/L	2.0	10	NA	4/19/11 20:24	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110418 Dissolved
Lab Code: R1102105-002

Service Request: R1102105
Date Collected: 4/18/11 1510
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 20:13	
Iron, Dissolved	6010C	100 U	µg/L	100	1	4/27/11	4/30/11 20:13	
Manganese, Dissolved	6010C	31	µg/L	10	1	4/27/11	4/30/11 20:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20110418
 Lab Code: R1102105-001

Service Request: R1102105
 Date Collected: 4/18/11 1510
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	63000		2500	200	500	NA	4/22/11 12:40		243340	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/22/11 12:40		243340	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/22/11 12:40		243340	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/22/11 12:40		243340	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/22/11 12:40		243340	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/22/11 12:40		243340	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/22/11 12:40		243340	
n-Butanol	25000	U	25000	3400	500	NA	4/22/11 12:40		243340	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/22/11 12:40		243340	
2-Hexanone	5000	U	5000	200	500	NA	4/22/11 12:40		243340	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/22/11 12:40		243340	
Acetone	10000	U	10000	800	500	NA	4/22/11 12:40		243340	
Benzene	2500	U	2500	160	500	NA	4/22/11 12:40		243340	
Bromodichloromethane	2500	U	2500	210	500	NA	4/22/11 12:40		243340	
Bromoform	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Bromomethane	2500	U	2500	200	500	NA	4/22/11 12:40		243340	
Carbon Disulfide	5000	U	5000	180	500	NA	4/22/11 12:40		243340	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/22/11 12:40		243340	
Chlorobenzene	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Chloroethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Chloroform	540	J	2500	150	500	NA	4/22/11 12:40		243340	
Chloromethane	2500	U	2500	230	500	NA	4/22/11 12:40		243340	
Cyclohexane	5000	U	5000	150	500	NA	4/22/11 12:40		243340	
Dibromochloromethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/22/11 12:40		243340	
Dichloromethane	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Ethylbenzene	2500	U	2500	210	500	NA	4/22/11 12:40		243340	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/22/11 12:40		243340	
Methyl Acetate	5000	U	5000	330	500	NA	4/22/11 12:40		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110418
Lab Code: R1102105-001

Service Request: R1102105
Date Collected: 4/18/11 1510
Date Received: 4/19/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Methylcyclohexane	5000	U	5000	150	500	NA	4/22/11 12:40		243340	
Styrene	2500	U	2500	180	500	NA	4/22/11 12:40		243340	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/22/11 12:40		243340	
Toluene	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Trichloroethene (TCE)	180	J	2500	150	500	NA	4/22/11 12:40		243340	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
Vinyl Chloride	1000	J	2500	150	500	NA	4/22/11 12:40		243340	
cis-1,2-Dichloroethene	21000		2500	150	500	NA	4/22/11 12:40		243340	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
m,p-Xylenes	2500	U	2500	410	500	NA	4/22/11 12:40		243340	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/22/11 12:40		243340	
o-Xylene	2500	U	2500	200	500	NA	4/22/11 12:40		243340	
trans-1,2-Dichloroethene	430	J	2500	150	500	NA	4/22/11 12:40		243340	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 12:40		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/22/11 12:40	
Dibromofluoromethane	111	89-119	4/22/11 12:40	
Toluene-d8	106	87-121	4/22/11 12:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110418
Lab Code: R1102105-001

Service Request: R1102105
Date Collected: 4/18/11 1510
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243146

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/22/11 14:57		243146	
Ethene	19		1.0	1	NA	4/22/11 14:57		243146	
Methane	61		2.0	1	NA	4/22/11 14:57		243146	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1510
Date Received: 4/19/11
Date Analyzed: 5/6/11 00:30

Sample Name: LC34-IW0002I-027.5-20110418
Lab Code: R1102105-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050511\C1638.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	2.3	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110418
Lab Code: R1102105-003

Service Request: R1102105
Date Collected: 4/18/11 1457
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	318		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:38	
Carbon, Total Organic (TOC), Average	9060	5.1		mg/L	1.0	1	NA	4/29/11 18:23	
Chloride	300.0	301		mg/L	10	50	NA	4/20/11 12:48	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 15:10	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:38	
Nitrite as Nitrogen	300.0	5.0	U	mg/L	5.0	50	NA	4/20/11 12:48	
Sulfate	300.0	31.8		mg/L	2.0	10	NA	4/19/11 20:38	
Sulfide, Total	SM 4500-S2- F	0.98	U	mg/L	0.98	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110418 Dissolved
Lab Code: R1102105-004

Service Request: R1102105
Date Collected: 4/18/11 1457
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 20:19	
Iron, Dissolved	6010C	110		µg/L	100	1	4/27/11	4/30/11 20:19	
Manganese, Dissolved	6010C	11		µg/L	10	1	4/27/11	4/30/11 20:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D-037.5-20110418
 Lab Code: R1102105-003

Service Request: R1102105
 Date Collected: 4/18/11 1457
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	13000		1300	100	250	NA	4/22/11 13:07		243340	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/22/11 13:07		243340	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/22/11 13:07		243340	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/22/11 13:07		243340	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/22/11 13:07		243340	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/22/11 13:07		243340	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/22/11 13:07		243340	
n-Butanol	13000	U	13000	1700	250	NA	4/22/11 13:07		243340	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/22/11 13:07		243340	
2-Hexanone	2500	U	2500	100	250	NA	4/22/11 13:07		243340	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/22/11 13:07		243340	
Acetone	5000	U	5000	400	250	NA	4/22/11 13:07		243340	
Benzene	1300	U	1300	78	250	NA	4/22/11 13:07		243340	
Bromodichloromethane	1300	U	1300	110	250	NA	4/22/11 13:07		243340	
Bromoform	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Bromomethane	1300	U	1300	100	250	NA	4/22/11 13:07		243340	
Carbon Disulfide	2500	U	2500	88	250	NA	4/22/11 13:07		243340	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/22/11 13:07		243340	
Chlorobenzene	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Chloroethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Chloroform	280	J	1300	75	250	NA	4/22/11 13:07		243340	
Chloromethane	1300	U	1300	120	250	NA	4/22/11 13:07		243340	
Cyclohexane	2500	U	2500	75	250	NA	4/22/11 13:07		243340	
Dibromochloromethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/22/11 13:07		243340	
Dichloromethane	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Ethylbenzene	1300	U	1300	110	250	NA	4/22/11 13:07		243340	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/22/11 13:07		243340	
Methyl Acetate	2500	U	2500	170	250	NA	4/22/11 13:07		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110418
Lab Code: R1102105-003

Service Request: R1102105
Date Collected: 4/18/11 1457
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Methylcyclohexane	2500	U	2500	75	250	NA	4/22/11 13:07		243340	
Styrene	1300	U	1300	88	250	NA	4/22/11 13:07		243340	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/22/11 13:07		243340	
Toluene	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
Trichloroethene (TCE)	490	J	1300	75	250	NA	4/22/11 13:07		243340	
Trichlorofluoromethane (CFC 11)	95	J	1300	75	250	NA	4/22/11 13:07		243340	
Vinyl Chloride	3500		1300	75	250	NA	4/22/11 13:07		243340	
cis-1,2-Dichloroethene	26000		1300	75	250	NA	4/22/11 13:07		243340	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
m,p-Xylenes	1300	U	1300	210	250	NA	4/22/11 13:07		243340	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/22/11 13:07		243340	
o-Xylene	1300	U	1300	100	250	NA	4/22/11 13:07		243340	
trans-1,2-Dichloroethene	370	J	1300	75	250	NA	4/22/11 13:07		243340	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/22/11 13:07		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/22/11 13:07	
Dibromofluoromethane	110	89-119	4/22/11 13:07	
Toluene-d8	105	87-121	4/22/11 13:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110418
Lab Code: R1102105-003

Service Request: R1102105
Date Collected: 4/18/11 1457
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243146

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/22/11 15:07		243146	
Ethene	110	D	2.0	2	NA	4/22/11 15:18		243146	
Methane	110	D	4.0	2	NA	4/22/11 15:18		243146	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1457
Date Received: 4/19/11
Date Analyzed: 5/6/11 07:40

Sample Name: LC34-IW0002D-037.5-20110418
Lab Code: R1102105-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050511\C1645.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	24	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110418
Lab Code: R1102105-005

Service Request: R1102105
Date Collected: 4/18/11 1020
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	270		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:51	
Carbon, Total Organic (TOC), Average	9060	3.2		mg/L	1.0	1	NA	4/29/11 19:33	
Chloride	300.0	83.8		mg/L	2.0	10	NA	4/19/11 20:51	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 15:23	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:51	
Nitrite as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 20:51	
Sulfate	300.0	49.2		mg/L	2.0	10	NA	4/19/11 20:51	
Sulfide, Total	SM 4500-S2- F	0.99	U	mg/L	0.99	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110418 Dissolved
Lab Code: R1102105-006

Service Request: R1102105
Date Collected: 4/18/11 1020
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 20:25	
Iron, Dissolved	6010C	230	µg/L	100	1	4/27/11	4/30/11 20:25	
Manganese, Dissolved	6010C	31	µg/L	10	1	4/27/11	4/30/11 20:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001A-024.5-20110418
 Lab Code: R1102105-005

Service Request: R1102105
 Date Collected: 4/18/11 1020
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	65000		2500	200	500	NA	4/22/11 13:34		243340	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/22/11 13:34		243340	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/22/11 13:34		243340	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/22/11 13:34		243340	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/22/11 13:34		243340	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/22/11 13:34		243340	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/22/11 13:34		243340	
n-Butanol	25000	U	25000	3400	500	NA	4/22/11 13:34		243340	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/22/11 13:34		243340	
2-Hexanone	5000	U	5000	200	500	NA	4/22/11 13:34		243340	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/22/11 13:34		243340	
Acetone	3500	J	10000	800	500	NA	4/22/11 13:34		243340	
Benzene	2500	U	2500	160	500	NA	4/22/11 13:34		243340	
Bromodichloromethane	2500	U	2500	210	500	NA	4/22/11 13:34		243340	
Bromoform	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Bromomethane	2500	U	2500	200	500	NA	4/22/11 13:34		243340	
Carbon Disulfide	5000	U	5000	180	500	NA	4/22/11 13:34		243340	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/22/11 13:34		243340	
Chlorobenzene	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Chloroethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Chloroform	650	J	2500	150	500	NA	4/22/11 13:34		243340	
Chloromethane	2500	U	2500	230	500	NA	4/22/11 13:34		243340	
Cyclohexane	5000	U	5000	150	500	NA	4/22/11 13:34		243340	
Dibromochloromethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/22/11 13:34		243340	
Dichloromethane	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Ethylbenzene	2500	U	2500	210	500	NA	4/22/11 13:34		243340	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/22/11 13:34		243340	
Methyl Acetate	5000	U	5000	330	500	NA	4/22/11 13:34		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110418
Lab Code: R1102105-005

Service Request: R1102105
Date Collected: 4/18/11 1020
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Methylcyclohexane	5000	U	5000	150	500	NA	4/22/11 13:34		243340	
Styrene	2500	U	2500	180	500	NA	4/22/11 13:34		243340	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/22/11 13:34		243340	
Toluene	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Trichloroethene (TCE)	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
Vinyl Chloride	2200	J	2500	150	500	NA	4/22/11 13:34		243340	
cis-1,2-Dichloroethene	39000		2500	150	500	NA	4/22/11 13:34		243340	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
m,p-Xylenes	2500	U	2500	410	500	NA	4/22/11 13:34		243340	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/22/11 13:34		243340	
o-Xylene	2500	U	2500	200	500	NA	4/22/11 13:34		243340	
trans-1,2-Dichloroethene	830	J	2500	150	500	NA	4/22/11 13:34		243340	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 13:34		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/22/11 13:34	
Dibromofluoromethane	113	89-119	4/22/11 13:34	
Toluene-d8	107	87-121	4/22/11 13:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110418
Lab Code: R1102105-005

Service Request: R1102105
Date Collected: 4/18/11 1020
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243146

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/22/11 15:28		243146	
Ethene	30		1.0	1	NA	4/22/11 15:28		243146	
Methane	76		2.0	1	NA	4/22/11 15:28		243146	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1020
Date Received: 4/19/11
Date Analyzed: 5/6/11 09:42

Sample Name: LC34-BW0001A-024.5-20110418
Lab Code: R1102105-005

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC03\DATA\050511\C1647.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.7	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110418
Lab Code: R1102105-007

Service Request: R1102105
Date Collected: 4/18/11 1040
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	329		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:04	
Carbon, Total Organic (TOC), Average	9060	5.7		mg/L	1.0	1	NA	4/29/11 20:09	
Chloride	300.0	258		mg/L	10	50	NA	4/20/11 13:28	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 15:36	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:04	
Nitrite as Nitrogen	300.0	5.0	U	mg/L	5.0	50	NA	4/20/11 13:28	*
Sulfate	300.0	44.1		mg/L	2.0	10	NA	4/19/11 21:04	
Sulfide, Total	SM 4500-S2- F	0.99	U	mg/L	0.99	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110418 Dissolved
Lab Code: R1102105-008

Service Request: R1102105
Date Collected: 4/18/11 1040
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 20:30	
Iron, Dissolved	6010C	110	µg/L	100	1	4/27/11	4/30/11 20:30	
Manganese, Dissolved	6010C	25	µg/L	10	1	4/27/11	4/30/11 20:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001B-031.5-20110418
 Lab Code: R1102105-007

Service Request: R1102105
 Date Collected: 4/18/11 1040
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,1,2,2-Tetrachloroethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,1,2-Trichloroethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	150000		5000	400	1000	NA	4/22/11 14:01		243340	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	370	1000	NA	4/22/11 14:01		243340	
1,2,4-Trichlorobenzene	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	430	1000	NA	4/22/11 14:01		243340	
1,2-Dibromoethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,2-Dichlorobenzene	5000	U	5000	400	1000	NA	4/22/11 14:01		243340	
1,2-Dichloroethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
1,2-Dichloropropane	5000	U	5000	660	1000	NA	4/22/11 14:01		243340	
1,3-Dichlorobenzene	5000	U	5000	360	1000	NA	4/22/11 14:01		243340	
1,4-Dichlorobenzene	5000	U	5000	340	1000	NA	4/22/11 14:01		243340	
n-Butanol	50000	U	50000	6700	1000	NA	4/22/11 14:01		243340	
2-Butanone (MEK)	10000	U	10000	1000	1000	NA	4/22/11 14:01		243340	
2-Hexanone	10000	U	10000	400	1000	NA	4/22/11 14:01		243340	
4-Methyl-2-pentanone	10000	U	10000	340	1000	NA	4/22/11 14:01		243340	
Acetone	11000	J	20000	1600	1000	NA	4/22/11 14:01		243340	
Benzene	5000	U	5000	310	1000	NA	4/22/11 14:01		243340	
Bromodichloromethane	5000	U	5000	410	1000	NA	4/22/11 14:01		243340	
Bromoform	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Bromomethane	5000	U	5000	400	1000	NA	4/22/11 14:01		243340	
Carbon Disulfide	10000	U	10000	350	1000	NA	4/22/11 14:01		243340	
Carbon Tetrachloride	5000	U	5000	360	1000	NA	4/22/11 14:01		243340	
Chlorobenzene	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Chloroethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Chloroform	700	J	5000	300	1000	NA	4/22/11 14:01		243340	
Chloromethane	5000	U	5000	460	1000	NA	4/22/11 14:01		243340	
Cyclohexane	10000	U	10000	300	1000	NA	4/22/11 14:01		243340	
Dibromochloromethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	730	1000	NA	4/22/11 14:01		243340	
Dichloromethane	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Ethylbenzene	5000	U	5000	420	1000	NA	4/22/11 14:01		243340	
Isopropylbenzene (Cumene)	5000	U	5000	340	1000	NA	4/22/11 14:01		243340	
Methyl Acetate	10000	U	10000	660	1000	NA	4/22/11 14:01		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110418
Lab Code: R1102105-007

Service Request: R1102105
Date Collected: 4/18/11 1040
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Methylcyclohexane	10000	U	10000	300	1000	NA	4/22/11 14:01		243340	
Styrene	5000	U	5000	350	1000	NA	4/22/11 14:01		243340	
Tetrachloroethene (PCE)	5000	U	5000	420	1000	NA	4/22/11 14:01		243340	
Toluene	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Trichloroethene (TCE)	14000		5000	300	1000	NA	4/22/11 14:01		243340	
Trichlorofluoromethane (CFC 11)	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
Vinyl Chloride	1800	J	5000	300	1000	NA	4/22/11 14:01		243340	
cis-1,2-Dichloroethene	28000		5000	300	1000	NA	4/22/11 14:01		243340	
cis-1,3-Dichloropropene	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
m,p-Xylenes	5000	U	5000	810	1000	NA	4/22/11 14:01		243340	
n-Butyl Acetate	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	
o-Xylene	5000	U	5000	400	1000	NA	4/22/11 14:01		243340	
trans-1,2-Dichloroethene	470	J	5000	300	1000	NA	4/22/11 14:01		243340	
trans-1,3-Dichloropropene	5000	U	5000	300	1000	NA	4/22/11 14:01		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/22/11 14:01	
Dibromofluoromethane	110	89-119	4/22/11 14:01	
Toluene-d8	107	87-121	4/22/11 14:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110418
Lab Code: R1102105-007

Service Request: R1102105
Date Collected: 4/18/11 1040
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 13:19		243684	
Ethene	17		1.0	1	NA	4/26/11 13:19		243684	
Methane	85		2.0	1	NA	4/26/11 13:19		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1040
Date Received: 4/19/11
Date Analyzed: 5/6/11 11:45

Sample Name: LC34-BW0001B-031.5-20110418
Lab Code: R1102105-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC03\DATA\050511\C1649.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	27	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	2.3	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110418
Lab Code: R1102105-009

Service Request: R1102105
Date Collected: 4/18/11 1120
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	341		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:17	
Carbon, Total Organic (TOC), Average	9060	7.3		mg/L	1.0	1	NA	4/29/11 20:44	
Chloride	300.0	570		mg/L	20	100	NA	4/20/11 13:42	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 15:49	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:17	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	4/20/11 13:42	*
Sulfate	300.0	26.9		mg/L	2.0	10	NA	4/19/11 21:17	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110418 Dissolved
Lab Code: R1102105-010

Service Request: R1102105
Date Collected: 4/18/11 1120
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 20:46	
Iron, Dissolved	6010C	110	µg/L	100	1	4/27/11	4/30/11 20:46	
Manganese, Dissolved	6010C	17	µg/L	10	1	4/27/11	4/30/11 20:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001C-038.5-20110418
 Lab Code: R1102105-009

Service Request: R1102105
 Date Collected: 4/18/11 1120
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	59000		2500	200	500	NA	4/22/11 14:29		243340	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/22/11 14:29		243340	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/22/11 14:29		243340	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/22/11 14:29		243340	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/22/11 14:29		243340	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/22/11 14:29		243340	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/22/11 14:29		243340	
n-Butanol	25000	U	25000	3400	500	NA	4/22/11 14:29		243340	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/22/11 14:29		243340	
2-Hexanone	5000	U	5000	200	500	NA	4/22/11 14:29		243340	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/22/11 14:29		243340	
Acetone	10000	U	10000	800	500	NA	4/22/11 14:29		243340	
Benzene	2500	U	2500	160	500	NA	4/22/11 14:29		243340	
Bromodichloromethane	2500	U	2500	210	500	NA	4/22/11 14:29		243340	
Bromoform	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Bromomethane	2500	U	2500	200	500	NA	4/22/11 14:29		243340	
Carbon Disulfide	5000	U	5000	180	500	NA	4/22/11 14:29		243340	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/22/11 14:29		243340	
Chlorobenzene	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Chloroethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Chloroform	520	J	2500	150	500	NA	4/22/11 14:29		243340	
Chloromethane	2500	U	2500	230	500	NA	4/22/11 14:29		243340	
Cyclohexane	5000	U	5000	150	500	NA	4/22/11 14:29		243340	
Dibromochloromethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/22/11 14:29		243340	
Dichloromethane	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Ethylbenzene	2500	U	2500	210	500	NA	4/22/11 14:29		243340	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/22/11 14:29		243340	
Methyl Acetate	5000	U	5000	330	500	NA	4/22/11 14:29		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110418
Lab Code: R1102105-009

Service Request: R1102105
Date Collected: 4/18/11 1120
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Methylcyclohexane	5000	U	5000	150	500	NA	4/22/11 14:29		243340	
Styrene	2500	U	2500	180	500	NA	4/22/11 14:29		243340	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/22/11 14:29		243340	
Toluene	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Trichloroethene (TCE)	45000		2500	150	500	NA	4/22/11 14:29		243340	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
Vinyl Chloride	630	J	2500	150	500	NA	4/22/11 14:29		243340	
cis-1,2-Dichloroethene	25000		2500	150	500	NA	4/22/11 14:29		243340	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
m,p-Xylenes	2500	U	2500	410	500	NA	4/22/11 14:29		243340	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/22/11 14:29		243340	
o-Xylene	2500	U	2500	200	500	NA	4/22/11 14:29		243340	
trans-1,2-Dichloroethene	260	J	2500	150	500	NA	4/22/11 14:29		243340	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/22/11 14:29		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/22/11 14:29	
Dibromofluoromethane	107	89-119	4/22/11 14:29	
Toluene-d8	103	87-121	4/22/11 14:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110418
Lab Code: R1102105-009

Service Request: R1102105
Date Collected: 4/18/11 1120
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0 U	1.0	1	NA	4/26/11 13:29		243684	
Ethene	9.5	1.0	1	NA	4/26/11 13:29		243684	
Methane	62	2.0	1	NA	4/26/11 13:29		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1120
Date Received: 4/19/11
Date Analyzed: 5/6/11 13:48

Sample Name: LC34-BW0001C-038.5-20110418
Lab Code: R1102105-009

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050511\C1651.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	65	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.2	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110418
Lab Code: R1102105-011

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	251		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:31	
Carbon, Total Organic (TOC), Average	9060	7.5		mg/L	1.0	1	NA	4/29/11 21:20	
Chloride	300.0	780		mg/L	20	100	NA	4/20/11 13:55	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 16:54	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:31	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	4/20/11 13:55	
Sulfate	300.0	76.4		mg/L	2.0	10	NA	4/19/11 21:31	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110418 Dissolved
Lab Code: R1102105-012

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 20:52	
Iron, Dissolved	6010C	110		µg/L	100	1	4/27/11	4/30/11 20:52	
Manganese, Dissolved	6010C	34		µg/L	10	1	4/27/11	4/30/11 20:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110418
Lab Code: R1102105-011

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,1,2,2-Tetrachloroethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,1,2-Trichloroethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	55000		5000	400	1000	NA	4/22/11 14:56		243340	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	370	1000	NA	4/22/11 14:56		243340	
1,2,4-Trichlorobenzene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	430	1000	NA	4/22/11 14:56		243340	
1,2-Dibromoethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,2-Dichlorobenzene	5000	U	5000	400	1000	NA	4/22/11 14:56		243340	
1,2-Dichloroethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
1,2-Dichloropropane	5000	U	5000	660	1000	NA	4/22/11 14:56		243340	
1,3-Dichlorobenzene	5000	U	5000	360	1000	NA	4/22/11 14:56		243340	
1,4-Dichlorobenzene	5000	U	5000	340	1000	NA	4/22/11 14:56		243340	
n-Butanol	50000	U	50000	6700	1000	NA	4/22/11 14:56		243340	
2-Butanone (MEK)	10000	U	10000	1000	1000	NA	4/22/11 14:56		243340	
2-Hexanone	10000	U	10000	400	1000	NA	4/22/11 14:56		243340	
4-Methyl-2-pentanone	10000	U	10000	340	1000	NA	4/22/11 14:56		243340	
Acetone	20000	U	20000	1600	1000	NA	4/22/11 14:56		243340	
Benzene	5000	U	5000	310	1000	NA	4/22/11 14:56		243340	
Bromodichloromethane	5000	U	5000	410	1000	NA	4/22/11 14:56		243340	
Bromoform	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Bromomethane	5000	U	5000	400	1000	NA	4/22/11 14:56		243340	
Carbon Disulfide	10000	U	10000	350	1000	NA	4/22/11 14:56		243340	
Carbon Tetrachloride	5000	U	5000	360	1000	NA	4/22/11 14:56		243340	
Chlorobenzene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Chloroethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Chloroform	790	J	5000	300	1000	NA	4/22/11 14:56		243340	
Chloromethane	5000	U	5000	460	1000	NA	4/22/11 14:56		243340	
Cyclohexane	10000	U	10000	300	1000	NA	4/22/11 14:56		243340	
Dibromochloromethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	730	1000	NA	4/22/11 14:56		243340	
Dichloromethane	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Ethylbenzene	5000	U	5000	420	1000	NA	4/22/11 14:56		243340	
Isopropylbenzene (Cumene)	5000	U	5000	340	1000	NA	4/22/11 14:56		243340	
Methyl Acetate	10000	U	10000	660	1000	NA	4/22/11 14:56		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110418
Lab Code: R1102105-011

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Methylcyclohexane	10000	U	10000	300	1000	NA	4/22/11 14:56		243340	
Styrene	5000	U	5000	350	1000	NA	4/22/11 14:56		243340	
Tetrachloroethene (PCE)	5000	U	5000	420	1000	NA	4/22/11 14:56		243340	
Toluene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Trichloroethene (TCE)	180000	D	10000	600	2000	NA	4/23/11 13:50		243343	
Trichlorofluoromethane (CFC 11)	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
Vinyl Chloride	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
cis-1,2-Dichloroethene	6100		5000	300	1000	NA	4/22/11 14:56		243340	
cis-1,3-Dichloropropene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
m,p-Xylenes	5000	U	5000	810	1000	NA	4/22/11 14:56		243340	
n-Butyl Acetate	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
o-Xylene	5000	U	5000	400	1000	NA	4/22/11 14:56		243340	
trans-1,2-Dichloroethene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	
trans-1,3-Dichloropropene	5000	U	5000	300	1000	NA	4/22/11 14:56		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	4/22/11 14:56	
Dibromofluoromethane	109	89-119	4/22/11 14:56	
Toluene-d8	104	87-121	4/22/11 14:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110418
Lab Code: R1102105-011

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 13:56		243684	
Ethene	5.3		1.0	1	NA	4/26/11 13:56		243684	
Methane	14		2.0	1	NA	4/26/11 13:56		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1400
Date Received: 4/19/11
Date Analyzed: 5/7/11 20:43

Sample Name: LC34-BW0001D-045.5-20110418
Lab Code: R1102105-011

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC03\DATA\050711\C1664.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	50	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.1	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-050.0-20110418
Lab Code: R1102105-013

Service Request: R1102105
Date Collected: 4/18/11 1535
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	167	mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.6	mg/L	1.0	10	NA	4/19/11 21:44	
Carbon, Total Organic (TOC), Average	9060	3.1	mg/L	1.0	1	NA	4/29/11 23:06	
Chloride	300.0	628	mg/L	40	200	NA	4/20/11 14:08	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 17:07	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	4/19/11 21:44	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	4/20/11 14:08	
Sulfate	300.0	105	mg/L	4.0	20	NA	4/29/11 23:14	
Sulfide, Total	SM 4500-S2- F	0.99 U	mg/L	0.99	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1535
Date Received: 4/19/11

Sample Name: LC34-IW0002D1-050.0-20110418 Dissolved
Lab Code: R1102105-014

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 20:58	
Iron, Dissolved	6010C	110		µg/L	100	1	4/27/11	4/30/11 20:58	
Manganese, Dissolved	6010C	13		µg/L	10	1	4/27/11	4/30/11 20:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-050.0-20110418
 Lab Code: R1102105-013

Service Request: R1102105
 Date Collected: 4/18/11 1535
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 15:23		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 15:23		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 15:23		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 15:23		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 15:23		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 15:23		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 15:23		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 15:23		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 15:23		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 15:23		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 15:23		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 15:23		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 15:23		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 15:23		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 15:23		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 15:23		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 15:23		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 15:23		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 15:23		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 15:23		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 15:23		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 15:23		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 15:23		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-050.0-20110418
 Lab Code: R1102105-013

Service Request: R1102105
 Date Collected: 4/18/11 1535
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 15:23		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 15:23		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 15:23		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Trichloroethene (TCE)	7.7		5.0	0.30	1	NA	4/22/11 15:23		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
Vinyl Chloride	0.98	J	5.0	0.30	1	NA	4/22/11 15:23		243340	
cis-1,2-Dichloroethene	24		5.0	0.30	1	NA	4/22/11 15:23		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 15:23		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 15:23		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 15:23		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/22/11 15:23	
Dibromofluoromethane	108	89-119	4/22/11 15:23	
Toluene-d8	104	87-121	4/22/11 15:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-050.0-20110418
Lab Code: R1102105-013

Service Request: R1102105
Date Collected: 4/18/11 1535
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 14:09		243684	
Ethene	1.0	U	1.0	1	NA	4/26/11 14:09		243684	
Methane	8.6		2.0	1	NA	4/26/11 14:09		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1535
Date Received: 4/19/11
Date Analyzed: 5/7/11 12:32

Sample Name: LC34-IW0002D1-050.0-20110418
Lab Code: R1102105-013

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050711\C1656.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110418
Lab Code: R1102105-015

Service Request: R1102105
Date Collected: 4/18/11 1220
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	167		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.2		mg/L	1.0	10	NA	4/19/11 21:57	
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/30/11 00:16	
Chloride	300.0	600		mg/L	40	200	NA	4/20/11 14:21	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 17:20	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/19/11 21:57	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/20/11 14:21	*
Sulfate	300.0	94.9		mg/L	2.0	10	NA	4/19/11 21:57	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110418 Dissolved
Lab Code: R1102105-016

Service Request: R1102105
Date Collected: 4/18/11 1220
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 21:04	
Iron, Dissolved	6010C	100	U	µg/L	100	1	4/27/11	4/30/11 21:04	
Manganese, Dissolved	6010C	16		µg/L	10	1	4/27/11	4/30/11 21:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20110418
 Lab Code: R1102105-015

Service Request: R1102105
 Date Collected: 4/18/11 1220
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,1,2,2-Tetrachloroethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,1,2-Trichloroethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.6	J	10	0.80	2	NA	4/22/11 15:50		243340	
1,1-Dichloroethane (1,1-DCA)	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,1-Dichloroethene (1,1-DCE)	0.86	J	10	0.74	2	NA	4/22/11 15:50		243340	
1,2,4-Trichlorobenzene	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,2-Dibromo-3-chloropropane (DBCP)	10	U	10	0.86	2	NA	4/22/11 15:50		243340	
1,2-Dibromoethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,2-Dichlorobenzene	10	U	10	0.80	2	NA	4/22/11 15:50		243340	
1,2-Dichloroethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
1,2-Dichloropropane	10	U	10	1.4	2	NA	4/22/11 15:50		243340	
1,3-Dichlorobenzene	10	U	10	0.72	2	NA	4/22/11 15:50		243340	
1,4-Dichlorobenzene	10	U	10	0.68	2	NA	4/22/11 15:50		243340	
n-Butanol	100	U	100	14	2	NA	4/22/11 15:50		243340	
2-Butanone (MEK)	20	U	20	2.0	2	NA	4/22/11 15:50		243340	
2-Hexanone	20	U	20	0.80	2	NA	4/22/11 15:50		243340	
4-Methyl-2-pentanone	20	U	20	0.68	2	NA	4/22/11 15:50		243340	
Acetone	40	U	40	3.2	2	NA	4/22/11 15:50		243340	
Benzene	10	U	10	0.62	2	NA	4/22/11 15:50		243340	
Bromodichloromethane	10	U	10	0.82	2	NA	4/22/11 15:50		243340	
Bromoform	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Bromomethane	10	U	10	0.80	2	NA	4/22/11 15:50		243340	
Carbon Disulfide	20	U	20	0.70	2	NA	4/22/11 15:50		243340	
Carbon Tetrachloride	10	U	10	0.72	2	NA	4/22/11 15:50		243340	
Chlorobenzene	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Chloroethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Chloroform	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Chloromethane	10	U	10	0.92	2	NA	4/22/11 15:50		243340	
Cyclohexane	20	U	20	0.60	2	NA	4/22/11 15:50		243340	
Dibromochloromethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Dichlorodifluoromethane (CFC 12)	10	U	10	1.5	2	NA	4/22/11 15:50		243340	
Dichloromethane	10	U	10	0.60	2	NA	4/22/11 15:50		243340	
Ethylbenzene	10	U	10	0.84	2	NA	4/22/11 15:50		243340	
Isopropylbenzene (Cumene)	10	U	10	0.68	2	NA	4/22/11 15:50		243340	
Methyl Acetate	20	U	20	1.4	2	NA	4/22/11 15:50		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110418
Lab Code: R1102105-015

Service Request: R1102105
Date Collected: 4/18/11 1220
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
Methylcyclohexane	20 U	20	0.60	2	NA	4/22/11 15:50		243340	
Styrene	10 U	10	0.70	2	NA	4/22/11 15:50		243340	
Tetrachloroethene (PCE)	10 U	10	0.84	2	NA	4/22/11 15:50		243340	
Toluene	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
Trichloroethene (TCE)	490 D	25	1.5	5	NA	4/23/11 14:17		243343	
Trichlorofluoromethane (CFC 11)	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
Vinyl Chloride	0.86 J	10	0.60	2	NA	4/22/11 15:50		243340	
cis-1,2-Dichloroethene	74	10	0.60	2	NA	4/22/11 15:50		243340	
cis-1,3-Dichloropropene	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
m,p-Xylenes	10 U	10	1.7	2	NA	4/22/11 15:50		243340	
n-Butyl Acetate	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
o-Xylene	10 U	10	0.80	2	NA	4/22/11 15:50		243340	
trans-1,2-Dichloroethene	10 U	10	0.60	2	NA	4/22/11 15:50		243340	
trans-1,3-Dichloropropene	10 U	10	0.60	2	NA	4/22/11 15:50		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/22/11 15:50	
Dibromofluoromethane	110	89-119	4/22/11 15:50	
Toluene-d8	105	87-121	4/22/11 15:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110418
Lab Code: R1102105-015

Service Request: R1102105
Date Collected: 4/18/11 1220
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 14:43		243684	
Ethene	1.0	U	1.0	1	NA	4/26/11 14:43		243684	
Methane	6.8		2.0	1	NA	4/26/11 14:43		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1220
Date Received: 4/19/11
Date Analyzed: 5/7/11 14:34

Sample Name: LC34-BW0001E-052.5-20110418
Lab Code: R1102105-015

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050711\C1658.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110418
Lab Code: R1102105-017

Service Request: R1102105
Date Collected: 4/18/11 1150
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	166	mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.1	mg/L	1.0	10	NA	4/19/11 22:37	
Carbon, Total Organic (TOC), Average	9060	3.3	mg/L	1.0	1	NA	4/30/11 00:52	
Chloride	300.0	636	mg/L	40	200	NA	4/20/11 14:35	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 17:33	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	4/19/11 22:37	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	4/20/11 14:35	*
Sulfate	300.0	112	mg/L	4.0	20	NA	4/22/11 04:45	
Sulfide, Total	SM 4500-S2- F	1.0 U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110418 Dissolved
Lab Code: R1102105-018

Service Request: R1102105
Date Collected: 4/18/11 1150
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 21:10	
Iron, Dissolved	6010C	110		µg/L	100	1	4/27/11	4/30/11 21:10	
Manganese, Dissolved	6010C	13		µg/L	10	1	4/27/11	4/30/11 21:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001F-059.5-20110418
 Lab Code: R1102105-017

Service Request: R1102105
 Date Collected: 4/18/11 1150
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 17:41		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 17:41		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 17:41		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 17:41		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 17:41		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 17:41		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 17:41		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 17:41		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 17:41		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 17:41		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 17:41		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 17:41		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 17:41		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 17:41		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 17:41		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 17:41		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 17:41		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 17:41		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 17:41		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 17:41		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 17:41		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 17:41		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 17:41		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110418
Lab Code: R1102105-017

Service Request: R1102105
Date Collected: 4/18/11 1150
Date Received: 4/19/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 17:41		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 17:41		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 17:41		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Trichloroethene (TCE)	1.1	J	5.0	0.30	1	NA	4/21/11 17:41		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
cis-1,2-Dichloroethene	0.41	J	5.0	0.30	1	NA	4/21/11 17:41		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 17:41		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 17:41		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 17:41		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/21/11 17:41	
Dibromofluoromethane	108	89-119	4/21/11 17:41	
Toluene-d8	111	87-121	4/21/11 17:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110418
Lab Code: R1102105-017

Service Request: R1102105
Date Collected: 4/18/11 1150
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 15:08		243684	
Ethene	1.0	U	1.0	1	NA	4/26/11 15:08		243684	
Methane	5.8		2.0	1	NA	4/26/11 15:08		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1150
Date Received: 4/19/11
Date Analyzed: 5/7/11 16:37

Sample Name: LC34-BW0001F-059.5-20110418
Lab Code: R1102105-017

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050711\C1660.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110418
Lab Code: R1102105-019

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/26/11 01:05	
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/30/11 01:27	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 17:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110418 Dissolved
Lab Code: R1102105-020

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 21:16	
Iron, Dissolved	6010C	100 U	µg/L	100	1	4/27/11	4/30/11 21:16	
Manganese, Dissolved	6010C	11	µg/L	10	1	4/27/11	4/30/11 21:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110418
Lab Code: R1102105-019

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 18:11		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 18:11		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 18:11		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 18:11		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 18:11		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 18:11		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 18:11		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 18:11		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 18:11		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 18:11		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 18:11		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 18:11		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 18:11		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 18:11		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 18:11		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 18:11		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 18:11		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 18:11		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 18:11		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 18:11		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 18:11		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 18:11		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 18:11		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110418
Lab Code: R1102105-019

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 18:11		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 18:11		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 18:11		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 18:11		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 18:11		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 18:11		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/21/11 18:11	
Dibromofluoromethane	109	89-119	4/21/11 18:11	
Toluene-d8	110	87-121	4/21/11 18:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110418
Lab Code: R1102105-019

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0 U	1.0	1	NA	4/26/11 15:28		243684	
Ethene	1.0 U	1.0	1	NA	4/26/11 15:28		243684	
Methane	5.8	2.0	1	NA	4/26/11 15:28		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/18/11 1435
Date Received: 4/19/11
Date Analyzed: 5/7/11 18:40

Sample Name: LC34-IW0076-075.0-20110418
Lab Code: R1102105-019

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050711\C1662.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0067D-040.5-20110418
Lab Code: R1102105-021

Service Request: R1102105
Date Collected: 4/18/11 1132
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.6		mg/L	1.0	1	NA	4/30/11 02:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0067D-040.5-20110418
 Lab Code: R1102105-021

Service Request: R1102105
 Date Collected: 4/18/11 1132
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 18:42		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 18:42		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 18:42		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 18:42		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 18:42		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 18:42		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 18:42		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 18:42		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 18:42		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 18:42		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 18:42		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 18:42		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 18:42		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 18:42		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 18:42		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 18:42		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 18:42		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 18:42		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 18:42		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 18:42		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 18:42		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 18:42		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 18:42		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0067D-040.5-20110418
Lab Code: R1102105-021

Service Request: R1102105
Date Collected: 4/18/11 1132
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 18:42		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 18:42		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 18:42		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
Vinyl Chloride	1.1	J	5.0	0.30	1	NA	4/21/11 18:42		243226	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 18:42		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 18:42		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 18:42		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/21/11 18:42	
Dibromofluoromethane	109	89-119	4/21/11 18:42	
Toluene-d8	112	87-121	4/21/11 18:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0067D1-068.0-20110418
Lab Code: R1102105-022

Service Request: R1102105
Date Collected: 4/18/11 1219
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/30/11 03:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0067D1-068.0-20110418
 Lab Code: R1102105-022

Service Request: R1102105
 Date Collected: 4/18/11 12:19
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 19:12		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 19:12		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 19:12		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 19:12		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 19:12		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 19:12		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 19:12		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 19:12		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 19:12		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 19:12		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 19:12		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 19:12		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 19:12		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 19:12		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 19:12		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 19:12		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 19:12		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 19:12		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 19:12		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 19:12		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 19:12		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 19:12		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 19:12		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0067D1-068.0-20110418
Lab Code: R1102105-022

Service Request: R1102105
Date Collected: 4/18/11 12:19
Date Received: 4/19/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 19:12		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 19:12		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 19:12		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 19:12		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 19:12		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 19:12		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/21/11 19:12	
Dibromofluoromethane	107	89-119	4/21/11 19:12	
Toluene-d8	110	87-121	4/21/11 19:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0070D-040.5-20110418
Lab Code: R1102105-023

Service Request: R1102105
Date Collected: 4/18/11 1021
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	4.1	mg/L	1.0	1	NA	4/30/11 03:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0070D-040.5-20110418
 Lab Code: R1102105-023

Service Request: R1102105
 Date Collected: 4/18/11 1021
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 19:42		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 19:42		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 19:42		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 19:42		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 19:42		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 19:42		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 19:42		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 19:42		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 19:42		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 19:42		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 19:42		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 19:42		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 19:42		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 19:42		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 19:42		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 19:42		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 19:42		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 19:42		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 19:42		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 19:42		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 19:42		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 19:42		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 19:42		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0070D-040.5-20110418
Lab Code: R1102105-023

Service Request: R1102105
Date Collected: 4/18/11 1021
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 19:42		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 19:42		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 19:42		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 19:42		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 19:42		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 19:42		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	111	85-122	4/21/11 19:42	
Dibromofluoromethane	111	89-119	4/21/11 19:42	
Toluene-d8	112	87-121	4/21/11 19:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0070D1-070.0-20110418
Lab Code: R1102105-024

Service Request: R1102105
Date Collected: 4/18/11 1056
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.2		mg/L	1.0	1	NA	4/30/11 04:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0070D1-070.0-20110418
 Lab Code: R1102105-024

Service Request: R1102105
 Date Collected: 4/18/11 1056
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 16:17		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 16:17		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 16:17		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 16:17		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 16:17		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 16:17		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 16:17		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 16:17		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 16:17		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 16:17		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 16:17		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 16:17		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 16:17		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 16:17		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 16:17		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 16:17		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 16:17		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 16:17		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 16:17		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 16:17		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 16:17		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 16:17		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 16:17		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0070D1-070.0-20110418
Lab Code: R1102105-024

Service Request: R1102105
Date Collected: 4/18/11 1056
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 16:17		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 16:17		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 16:17		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 16:17		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 16:17		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 16:17		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	113	85-122	4/22/11 16:17	
Dibromofluoromethane	112	89-119	4/22/11 16:17	
Toluene-d8	108	87-121	4/22/11 16:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0071D-040.5-20110418
Lab Code: R1102105-025

Service Request: R1102105
Date Collected: 4/18/11 1356
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.6		mg/L	1.0	1	NA	4/30/11 06:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0071D-040.5-20110418
 Lab Code: R1102105-025

Service Request: R1102105
 Date Collected: 4/18/11 1356
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 16:45		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 16:45		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 16:45		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 16:45		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 16:45		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 16:45		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 16:45		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 16:45		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 16:45		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 16:45		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 16:45		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 16:45		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 16:45		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 16:45		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 16:45		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 16:45		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 16:45		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 16:45		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 16:45		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 16:45		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 16:45		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 16:45		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 16:45		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0071D-040.5-20110418
 Lab Code: R1102105-025

Service Request: R1102105
 Date Collected: 4/18/11 1356
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 16:45		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 16:45		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 16:45		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 16:45		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 16:45		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 16:45		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	4/22/11 16:45	
Dibromofluoromethane	108	89-119	4/22/11 16:45	
Toluene-d8	105	87-121	4/22/11 16:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0071D1-070.0-20110418
Lab Code: R1102105-026

Service Request: R1102105
Date Collected: 4/18/11 1423
Date Received: 4/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/30/11 07:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0071D1-070.0-20110418
 Lab Code: R1102105-026

Service Request: R1102105
 Date Collected: 4/18/11 1423
 Date Received: 4/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 17:12		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 17:12		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 17:12		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 17:12		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 17:12		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 17:12		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 17:12		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 17:12		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 17:12		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 17:12		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 17:12		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 17:12		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 17:12		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 17:12		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 17:12		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 17:12		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 17:12		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 17:12		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 17:12		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 17:12		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 17:12		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 17:12		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 17:12		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0071D1-070.0-20110418
Lab Code: R1102105-026

Service Request: R1102105
Date Collected: 4/18/11 1423
Date Received: 4/19/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 17:12		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 17:12		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 17:12		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 17:12		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 17:12		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 17:12		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/22/11 17:12	
Dibromofluoromethane	108	89-119	4/22/11 17:12	
Toluene-d8	107	87-121	4/22/11 17:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-EF0005-000.0-20110418
 Lab Code: R1102105-027

Service Request: R1102105
 Date Collected: 4/18/11 1525
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 17:39		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 17:39		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 17:39		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 17:39		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 17:39		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 17:39		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 17:39		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 17:39		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 17:39		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 17:39		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 17:39		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 17:39		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 17:39		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 17:39		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 17:39		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 17:39		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 17:39		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 17:39		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 17:39		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 17:39		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 17:39		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 17:39		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 17:39		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0005-000.0-20110418
Lab Code: R1102105-027

Service Request: R1102105
Date Collected: 4/18/11 1525
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 17:39		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 17:39		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 17:39		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 17:39		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 17:39		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 17:39		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	4/22/11 17:39	
Dibromofluoromethane	107	89-119	4/22/11 17:39	
Toluene-d8	104	87-121	4/22/11 17:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0006.000.0-20110418
Lab Code: R1102105-028

Service Request: R1102105
Date Collected: 4/18/11 1525
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 18:06		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 18:06		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 18:06		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 18:06		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 18:06		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 18:06		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 18:06		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 18:06		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 18:06		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 18:06		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 18:06		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 18:06		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 18:06		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 18:06		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 18:06		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 18:06		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 18:06		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 18:06		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 18:06		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 18:06		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 18:06		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 18:06		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 18:06		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-EF0006.000.0-20110418
Lab Code: R1102105-028

Service Request: R1102105
Date Collected: 4/18/11 1525
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 18:06		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 18:06		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 18:06		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 18:06		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 18:06		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 18:06		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/22/11 18:06	
Dibromofluoromethane	106	89-119	4/22/11 18:06	
Toluene-d8	105	87-121	4/22/11 18:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110418-01
 Lab Code: R1102105-029

Service Request: R1102105
 Date Collected: 4/18/11
 Date Received: 4/19/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 18:33		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 18:33		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 18:33		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 18:33		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 18:33		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 18:33		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 18:33		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 18:33		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 18:33		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 18:33		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 18:33		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 18:33		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 18:33		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 18:33		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 18:33		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 18:33		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 18:33		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 18:33		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 18:33		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 18:33		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 18:33		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 18:33		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 18:33		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110418-01
Lab Code: R1102105-029

Service Request: R1102105
Date Collected: 4/18/11
Date Received: 4/19/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 18:33		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 18:33		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 18:33		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 18:33		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 18:33		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 18:33		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/22/11 18:33	
Dibromofluoromethane	110	89-119	4/22/11 18:33	
Toluene-d8	107	87-121	4/22/11 18:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419
Lab Code: R1102105-030

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	223		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.5		mg/L	1.0	10	NA	4/20/11 17:54	
Carbon, Total Organic (TOC), Average	9060	4.4		mg/L	1.0	1	NA	4/30/11 07:56	
Chloride	300.0	642		mg/L	40	200	NA	4/21/11 11:43	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 18:00	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 17:54	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/21/11 11:43	*
Sulfate	300.0	61.2		mg/L	2.0	10	NA	4/20/11 17:54	
Sulfide, Total	SM 4500-S2- F	1.0		mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419 Dissolved
Lab Code: R1102105-031

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 21:21	
Iron, Dissolved	6010C	120		µg/L	100	1	4/27/11	4/30/11 21:21	
Manganese, Dissolved	6010C	10		µg/L	10	1	4/27/11	4/30/11 21:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110419
 Lab Code: R1102105-030

Service Request: R1102105
 Date Collected: 4/19/11 0917
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	8500		1300	100	250	NA	4/22/11 19:00		243340	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/22/11 19:00		243340	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/22/11 19:00		243340	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/22/11 19:00		243340	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/22/11 19:00		243340	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/22/11 19:00		243340	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/22/11 19:00		243340	
n-Butanol	13000	U	13000	1700	250	NA	4/22/11 19:00		243340	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/22/11 19:00		243340	
2-Hexanone	2500	U	2500	100	250	NA	4/22/11 19:00		243340	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/22/11 19:00		243340	
Acetone	5000	U	5000	400	250	NA	4/22/11 19:00		243340	
Benzene	1300	U	1300	78	250	NA	4/22/11 19:00		243340	
Bromodichloromethane	1300	U	1300	110	250	NA	4/22/11 19:00		243340	
Bromoform	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Bromomethane	1300	U	1300	100	250	NA	4/22/11 19:00		243340	
Carbon Disulfide	2500	U	2500	88	250	NA	4/22/11 19:00		243340	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/22/11 19:00		243340	
Chlorobenzene	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Chloroethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Chloroform	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Chloromethane	1300	U	1300	120	250	NA	4/22/11 19:00		243340	
Cyclohexane	2500	U	2500	75	250	NA	4/22/11 19:00		243340	
Dibromochloromethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/22/11 19:00		243340	
Dichloromethane	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Ethylbenzene	1300	U	1300	110	250	NA	4/22/11 19:00		243340	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/22/11 19:00		243340	
Methyl Acetate	2500	U	2500	170	250	NA	4/22/11 19:00		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419
Lab Code: R1102105-030

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Methylcyclohexane	2500	U	2500	75	250	NA	4/22/11 19:00		243340	
Styrene	1300	U	1300	88	250	NA	4/22/11 19:00		243340	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/22/11 19:00		243340	
Toluene	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Trichloroethene (TCE)	12000		1300	75	250	NA	4/22/11 19:00		243340	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
Vinyl Chloride	990	J	1300	75	250	NA	4/22/11 19:00		243340	
cis-1,2-Dichloroethene	25000		1300	75	250	NA	4/22/11 19:00		243340	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
m,p-Xylenes	1300	U	1300	210	250	NA	4/22/11 19:00		243340	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/22/11 19:00		243340	
o-Xylene	1300	U	1300	100	250	NA	4/22/11 19:00		243340	
trans-1,2-Dichloroethene	170	J	1300	75	250	NA	4/22/11 19:00		243340	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/22/11 19:00		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	4/22/11 19:00	
Dibromofluoromethane	106	89-119	4/22/11 19:00	
Toluene-d8	104	87-121	4/22/11 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419
Lab Code: R1102105-030

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 15:43		243684	
Ethene	11		1.0	1	NA	4/26/11 15:43		243684	
Methane	47		2.0	1	NA	4/26/11 15:43		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11
Date Analyzed: 5/8/11 02:59

Sample Name: LC34-RW0007-038.5-20110419
Lab Code: R1102105-030

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050711\C1670.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	22	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419-D
Lab Code: R1102105-032

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	221		mg/L	2.0	1	NA	4/26/11 10:24	
Carbon, Total Organic (TOC), Average	9060	4.5		mg/L	1.0	1	NA	4/30/11 08:31	
Chloride	300.0	645		mg/L	40	200	NA	4/21/11 11:56	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 18:07	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/21/11 11:56	*
Sulfate	300.0	60.5		mg/L	2.0	10	NA	4/20/11 18:07	
Sulfide, Total	SM 4500-S2- F	0.98	U	mg/L	0.98	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11

Sample Name: LC34-RW0007-038.5-20110419-D Dissolved
Lab Code: R1102105-033

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/21/11	4/27/11 00:14	
Iron, Dissolved	6010C	100 U	µg/L	100	1	4/21/11	4/27/11 00:14	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	4/21/11	4/27/11 00:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110419-D
 Lab Code: R1102105-032

Service Request: R1102105
 Date Collected: 4/19/11 09:17
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,1,2,2-Tetrachloroethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,1,2-Trichloroethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,1,2-Trichloro-1,2,2-trifluoroethane	8700		1000	80	200	NA	4/23/11 15:11		243343	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	200	NA	4/23/11 15:11		243343	
1,2,4-Trichlorobenzene	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	200	NA	4/23/11 15:11		243343	
1,2-Dibromoethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,2-Dichlorobenzene	1000	U	1000	80	200	NA	4/23/11 15:11		243343	
1,2-Dichloroethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
1,2-Dichloropropane	1000	U	1000	140	200	NA	4/23/11 15:11		243343	
1,3-Dichlorobenzene	1000	U	1000	72	200	NA	4/23/11 15:11		243343	
1,4-Dichlorobenzene	1000	U	1000	68	200	NA	4/23/11 15:11		243343	
n-Butanol	10000	U	10000	1400	200	NA	4/23/11 15:11		243343	
2-Butanone (MEK)	2000	U	2000	200	200	NA	4/23/11 15:11		243343	
2-Hexanone	2000	U	2000	80	200	NA	4/23/11 15:11		243343	
4-Methyl-2-pentanone	2000	U	2000	68	200	NA	4/23/11 15:11		243343	
Acetone	4000	U	4000	320	200	NA	4/23/11 15:11		243343	
Benzene	1000	U	1000	62	200	NA	4/23/11 15:11		243343	
Bromodichloromethane	1000	U	1000	82	200	NA	4/23/11 15:11		243343	
Bromoform	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Bromomethane	1000	U	1000	80	200	NA	4/23/11 15:11		243343	
Carbon Disulfide	2000	U	2000	70	200	NA	4/23/11 15:11		243343	
Carbon Tetrachloride	1000	U	1000	72	200	NA	4/23/11 15:11		243343	
Chlorobenzene	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Chloroethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Chloroform	100	J	1000	60	200	NA	4/23/11 15:11		243343	
Chloromethane	1000	U	1000	92	200	NA	4/23/11 15:11		243343	
Cyclohexane	2000	U	2000	60	200	NA	4/23/11 15:11		243343	
Dibromochloromethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	200	NA	4/23/11 15:11		243343	
Dichloromethane	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Ethylbenzene	1000	U	1000	84	200	NA	4/23/11 15:11		243343	
Isopropylbenzene (Cumene)	1000	U	1000	68	200	NA	4/23/11 15:11		243343	
Methyl Acetate	2000	U	2000	140	200	NA	4/23/11 15:11		243343	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110419-D
Lab Code: R1102105-032

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Methylcyclohexane	2000	U	2000	60	200	NA	4/23/11 15:11		243343	
Styrene	1000	U	1000	70	200	NA	4/23/11 15:11		243343	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	4/23/11 15:11		243343	
Toluene	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Trichloroethene (TCE)	12000		1000	60	200	NA	4/23/11 15:11		243343	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
Vinyl Chloride	900	J	1000	60	200	NA	4/23/11 15:11		243343	
cis-1,2-Dichloroethene	23000		1000	60	200	NA	4/23/11 15:11		243343	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
m,p-Xylenes	1000	U	1000	170	200	NA	4/23/11 15:11		243343	
n-Butyl Acetate	1000	U	1000	60	200	NA	4/23/11 15:11		243343	
o-Xylene	1000	U	1000	80	200	NA	4/23/11 15:11		243343	
trans-1,2-Dichloroethene	160	J	1000	60	200	NA	4/23/11 15:11		243343	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/23/11 15:11		243343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/23/11 15:11	
Dibromofluoromethane	110	89-119	4/23/11 15:11	
Toluene-d8	105	87-121	4/23/11 15:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110419-D
 Lab Code: R1102105-032

Service Request: R1102105
 Date Collected: 4/19/11 0917
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 15:55		243684	
Ethene	11		1.0	1	NA	4/26/11 15:55		243684	
Methane	47		2.0	1	NA	4/26/11 15:55		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 0917
Date Received: 4/20/11
Date Analyzed: 5/9/11 10:54

Sample Name: LC34-RW0007-038.5-20110419-D
Lab Code: R1102105-032

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC03\DATA\050911\C1683.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	22	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-038.5-20110419
Lab Code: R1102105-034

Service Request: R1102105
Date Collected: 4/19/11 1027
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	173	mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.7	mg/L	1.0	10	NA	4/20/11 18:47	
Carbon, Total Organic (TOC), Average	9060	3.4	mg/L	1.0	1	NA	4/30/11 09:07	
Chloride	300.0	675	mg/L	40	200	NA	4/21/11 12:09	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 18:39	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	4/20/11 18:47	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	4/21/11 12:09	*
Sulfate	300.0	92.4	mg/L	2.0	10	NA	4/21/11 13:03	
Sulfide, Total	SM 4500-S2- F	1.0 U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-038.5-20110419 Dissolved
Lab Code: R1102105-035

Service Request: R1102105
Date Collected: 4/19/11 1027
Date Received: 4/20/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	4/27/11	4/30/11 21:27	
Iron, Dissolved	6010C	120	µg/L	100	1	4/27/11	4/30/11 21:27	
Manganese, Dissolved	6010C	15	µg/L	10	1	4/27/11	4/30/11 21:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-038.5-20110419
 Lab Code: R1102105-034

Service Request: R1102105
 Date Collected: 4/19/11 1027
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,1,2,2-Tetrachloroethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,1,2-Trichloroethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,1,2-Trichloro-1,2,2-trifluoroethane	160		50	4.0	10	NA	4/25/11 10:59		243441	
1,1-Dichloroethane (1,1-DCA)	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,1-Dichloroethene (1,1-DCE)	50	U	50	3.7	10	NA	4/25/11 10:59		243441	
1,2,4-Trichlorobenzene	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	4.3	10	NA	4/25/11 10:59		243441	
1,2-Dibromoethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,2-Dichlorobenzene	50	U	50	4.0	10	NA	4/25/11 10:59		243441	
1,2-Dichloroethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
1,2-Dichloropropane	50	U	50	6.7	10	NA	4/25/11 10:59		243441	
1,3-Dichlorobenzene	50	U	50	3.6	10	NA	4/25/11 10:59		243441	
1,4-Dichlorobenzene	50	U	50	3.5	10	NA	4/25/11 10:59		243441	
n-Butanol	500	U	500	67	10	NA	4/25/11 10:59		243441	
2-Butanone (MEK)	100	U	100	10	10	NA	4/25/11 10:59		243441	
2-Hexanone	100	U	100	4.0	10	NA	4/25/11 10:59		243441	
4-Methyl-2-pentanone	100	U	100	3.5	10	NA	4/25/11 10:59		243441	
Acetone	200	U	200	16	10	NA	4/25/11 10:59		243441	
Benzene	50	U	50	3.1	10	NA	4/25/11 10:59		243441	
Bromodichloromethane	50	U	50	4.1	10	NA	4/25/11 10:59		243441	
Bromoform	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Bromomethane	50	U	50	4.0	10	NA	4/25/11 10:59		243441	
Carbon Disulfide	100	U	100	3.5	10	NA	4/25/11 10:59		243441	
Carbon Tetrachloride	50	U	50	3.6	10	NA	4/25/11 10:59		243441	
Chlorobenzene	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Chloroethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Chloroform	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Chloromethane	50	U	50	4.7	10	NA	4/25/11 10:59		243441	
Cyclohexane	100	U	100	3.0	10	NA	4/25/11 10:59		243441	
Dibromochloromethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Dichlorodifluoromethane (CFC 12)	50	U	50	7.3	10	NA	4/25/11 10:59		243441	
Dichloromethane	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Ethylbenzene	50	U	50	4.2	10	NA	4/25/11 10:59		243441	
Isopropylbenzene (Cumene)	50	U	50	3.5	10	NA	4/25/11 10:59		243441	
Methyl Acetate	100	U	100	6.7	10	NA	4/25/11 10:59		243441	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-038.5-20110419
Lab Code: R1102105-034

Service Request: R1102105
Date Collected: 4/19/11 10:27
Date Received: 4/20/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Methylcyclohexane	100	U	100	3.0	10	NA	4/25/11 10:59		243441	
Styrene	50	U	50	3.5	10	NA	4/25/11 10:59		243441	
Tetrachloroethene (PCE)	50	U	50	4.2	10	NA	4/25/11 10:59		243441	
Toluene	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Trichloroethene (TCE)	1000		50	3.0	10	NA	4/25/11 10:59		243441	
Trichlorofluoromethane (CFC 11)	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
Vinyl Chloride	24	J	50	3.0	10	NA	4/25/11 10:59		243441	
cis-1,2-Dichloroethene	510		50	3.0	10	NA	4/25/11 10:59		243441	
cis-1,3-Dichloropropene	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
m,p-Xylenes	50	U	50	8.2	10	NA	4/25/11 10:59		243441	
n-Butyl Acetate	50	U	50	3.0	10	NA	4/25/11 10:59		243441	
o-Xylene	50	U	50	4.0	10	NA	4/25/11 10:59		243441	
trans-1,2-Dichloroethene	3.0	J	50	3.0	10	NA	4/25/11 10:59		243441	
trans-1,3-Dichloropropene	50	U	50	3.0	10	NA	4/25/11 10:59		243441	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/25/11 10:59	
Dibromofluoromethane	109	89-119	4/25/11 10:59	
Toluene-d8	107	87-121	4/25/11 10:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-038.5-20110419
Lab Code: R1102105-034

Service Request: R1102105
Date Collected: 4/19/11 1027
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 16:31		243684	
Ethene	1.0	U	1.0	1	NA	4/26/11 16:31		243684	
Methane	8.8		2.0	1	NA	4/26/11 16:31		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1027
Date Received: 4/20/11
Date Analyzed: 5/9/11 12:57

Sample Name: LC34-RW0008-038.5-20110419
Lab Code: R1102105-034

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC03\DATA\050911\C1685.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-038.5-20110419-D
 Lab Code: R1102105-036

Service Request: R1102105
 Date Collected: 4/19/11 1027
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,1,2,2-Tetrachloroethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,1,2-Trichloroethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,1,2-Trichloro-1,2,2-trifluoroethane	180		50	4.0	10	NA	4/25/11 11:27		243441	
1,1-Dichloroethane (1,1-DCA)	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,1-Dichloroethene (1,1-DCE)	50	U	50	3.7	10	NA	4/25/11 11:27		243441	
1,2,4-Trichlorobenzene	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	4.3	10	NA	4/25/11 11:27		243441	
1,2-Dibromoethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,2-Dichlorobenzene	50	U	50	4.0	10	NA	4/25/11 11:27		243441	
1,2-Dichloroethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
1,2-Dichloropropane	50	U	50	6.7	10	NA	4/25/11 11:27		243441	
1,3-Dichlorobenzene	50	U	50	3.6	10	NA	4/25/11 11:27		243441	
1,4-Dichlorobenzene	50	U	50	3.5	10	NA	4/25/11 11:27		243441	
n-Butanol	500	U	500	67	10	NA	4/25/11 11:27		243441	
2-Butanone (MEK)	100	U	100	10	10	NA	4/25/11 11:27		243441	
2-Hexanone	100	U	100	4.0	10	NA	4/25/11 11:27		243441	
4-Methyl-2-pentanone	100	U	100	3.5	10	NA	4/25/11 11:27		243441	
Acetone	200	U	200	16	10	NA	4/25/11 11:27		243441	
Benzene	50	U	50	3.1	10	NA	4/25/11 11:27		243441	
Bromodichloromethane	50	U	50	4.1	10	NA	4/25/11 11:27		243441	
Bromoform	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Bromomethane	50	U	50	4.0	10	NA	4/25/11 11:27		243441	
Carbon Disulfide	100	U	100	3.5	10	NA	4/25/11 11:27		243441	
Carbon Tetrachloride	50	U	50	3.6	10	NA	4/25/11 11:27		243441	
Chlorobenzene	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Chloroethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Chloroform	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Chloromethane	50	U	50	4.7	10	NA	4/25/11 11:27		243441	
Cyclohexane	100	U	100	3.0	10	NA	4/25/11 11:27		243441	
Dibromochloromethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Dichlorodifluoromethane (CFC 12)	50	U	50	7.3	10	NA	4/25/11 11:27		243441	
Dichloromethane	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Ethylbenzene	50	U	50	4.2	10	NA	4/25/11 11:27		243441	
Isopropylbenzene (Cumene)	50	U	50	3.5	10	NA	4/25/11 11:27		243441	
Methyl Acetate	100	U	100	6.7	10	NA	4/25/11 11:27		243441	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-038.5-20110419-D
Lab Code: R1102105-036

Service Request: R1102105
Date Collected: 4/19/11 10:27
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Methylcyclohexane	100	U	100	3.0	10	NA	4/25/11 11:27		243441	
Styrene	50	U	50	3.5	10	NA	4/25/11 11:27		243441	
Tetrachloroethene (PCE)	50	U	50	4.2	10	NA	4/25/11 11:27		243441	
Toluene	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Trichloroethene (TCE)	1100		50	3.0	10	NA	4/25/11 11:27		243441	
Trichlorofluoromethane (CFC 11)	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
Vinyl Chloride	23	J	50	3.0	10	NA	4/25/11 11:27		243441	
cis-1,2-Dichloroethene	500		50	3.0	10	NA	4/25/11 11:27		243441	
cis-1,3-Dichloropropene	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
m,p-Xylenes	50	U	50	8.2	10	NA	4/25/11 11:27		243441	
n-Butyl Acetate	50	U	50	3.0	10	NA	4/25/11 11:27		243441	
o-Xylene	50	U	50	4.0	10	NA	4/25/11 11:27		243441	
trans-1,2-Dichloroethene	3.3	J	50	3.0	10	NA	4/25/11 11:27		243441	
trans-1,3-Dichloropropene	50	U	50	3.0	10	NA	4/25/11 11:27		243441	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	111	85-122	4/25/11 11:27	
Dibromofluoromethane	111	89-119	4/25/11 11:27	
Toluene-d8	108	87-121	4/25/11 11:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20110419
Lab Code: R1102105-037

Service Request: R1102105
Date Collected: 4/19/11 0915
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/27/11 01:16	
Carbon, Total Organic (TOC), Average	9060	3.0		mg/L	1.0	1	NA	4/30/11 09:42	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 18:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002A-024.5-20110419
 Lab Code: R1102105-037

Service Request: R1102105
 Date Collected: 4/19/11 0915
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		1300	100	250	NA	4/26/11 14:49		243491	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/26/11 14:49		243491	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/26/11 14:49		243491	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/26/11 14:49		243491	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/26/11 14:49		243491	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/26/11 14:49		243491	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/26/11 14:49		243491	
n-Butanol	13000	U	13000	1700	250	NA	4/26/11 14:49		243491	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/26/11 14:49		243491	
2-Hexanone	2500	U	2500	100	250	NA	4/26/11 14:49		243491	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/26/11 14:49		243491	
Acetone	5000	U	5000	400	250	NA	4/26/11 14:49		243491	
Benzene	1300	U	1300	78	250	NA	4/26/11 14:49		243491	
Bromodichloromethane	1300	U	1300	110	250	NA	4/26/11 14:49		243491	
Bromoform	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Bromomethane	1300	U	1300	100	250	NA	4/26/11 14:49		243491	
Carbon Disulfide	2500	U	2500	88	250	NA	4/26/11 14:49		243491	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/26/11 14:49		243491	
Chlorobenzene	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Chloroethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Chloroform	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Chloromethane	1300	U	1300	120	250	NA	4/26/11 14:49		243491	
Cyclohexane	2500	U	2500	75	250	NA	4/26/11 14:49		243491	
Dibromochloromethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/26/11 14:49		243491	
Dichloromethane	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Ethylbenzene	1300	U	1300	110	250	NA	4/26/11 14:49		243491	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/26/11 14:49		243491	
Methyl Acetate	2500	U	2500	170	250	NA	4/26/11 14:49		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20110419
Lab Code: R1102105-037

Service Request: R1102105
Date Collected: 4/19/11 0915
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Methylcyclohexane	2500	U	2500	75	250	NA	4/26/11 14:49		243491	
Styrene	1300	U	1300	88	250	NA	4/26/11 14:49		243491	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/26/11 14:49		243491	
Toluene	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Trichloroethene (TCE)	140	J	1300	75	250	NA	4/26/11 14:49		243491	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
Vinyl Chloride	1900		1300	75	250	NA	4/26/11 14:49		243491	
cis-1,2-Dichloroethene	41000		1300	75	250	NA	4/26/11 14:49		243491	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
m,p-Xylenes	1300	U	1300	210	250	NA	4/26/11 14:49		243491	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/26/11 14:49		243491	
o-Xylene	1300	U	1300	100	250	NA	4/26/11 14:49		243491	
trans-1,2-Dichloroethene	820	J	1300	75	250	NA	4/26/11 14:49		243491	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/26/11 14:49		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/26/11 14:49	
Dibromofluoromethane	106	89-119	4/26/11 14:49	
Toluene-d8	103	87-121	4/26/11 14:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20110419
Lab Code: R1102105-037

Service Request: R1102105
Date Collected: 4/19/11 0915
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 12:13		243805	
Ethene	33		1.0	1	NA	4/27/11 12:13		243805	
Methane	75		2.0	1	NA	4/27/11 12:13		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 0915
Date Received: 4/20/11
Date Analyzed: 5/9/11 15:02

Sample Name: LC34-BW0002A-024.5-20110419
Lab Code: R1102105-037

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\C1687.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	2.4	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20110419
Lab Code: R1102105-038

Service Request: R1102105
Date Collected: 4/19/11 1020
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/26/11 01:18	
Carbon, Total Organic (TOC), Average	9060	4.1		mg/L	1.0	1	NA	4/30/11 10:17	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 19:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002B-031.5-20110419
 Lab Code: R1102105-038

Service Request: R1102105
 Date Collected: 4/19/11 1020
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,1,2-Trichloro-1,2,2-trifluoroethane	24000		1300	100	250	NA	4/23/11 14:44		243343	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/23/11 14:44		243343	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/23/11 14:44		243343	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/23/11 14:44		243343	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/23/11 14:44		243343	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/23/11 14:44		243343	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/23/11 14:44		243343	
n-Butanol	13000	U	13000	1700	250	NA	4/23/11 14:44		243343	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/23/11 14:44		243343	
2-Hexanone	2500	U	2500	100	250	NA	4/23/11 14:44		243343	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/23/11 14:44		243343	
Acetone	1900	J	5000	400	250	NA	4/23/11 14:44		243343	
Benzene	1300	U	1300	78	250	NA	4/23/11 14:44		243343	
Bromodichloromethane	1300	U	1300	110	250	NA	4/23/11 14:44		243343	
Bromoform	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Bromomethane	1300	U	1300	100	250	NA	4/23/11 14:44		243343	
Carbon Disulfide	2500	U	2500	88	250	NA	4/23/11 14:44		243343	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/23/11 14:44		243343	
Chlorobenzene	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Chloroethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Chloroform	250	J	1300	75	250	NA	4/23/11 14:44		243343	
Chloromethane	1300	U	1300	120	250	NA	4/23/11 14:44		243343	
Cyclohexane	2500	U	2500	75	250	NA	4/23/11 14:44		243343	
Dibromochloromethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/23/11 14:44		243343	
Dichloromethane	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Ethylbenzene	1300	U	1300	110	250	NA	4/23/11 14:44		243343	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/23/11 14:44		243343	
Methyl Acetate	2500	U	2500	170	250	NA	4/23/11 14:44		243343	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002B-031.5-20110419
 Lab Code: R1102105-038

Service Request: R1102105
 Date Collected: 4/19/11 1020
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Methylcyclohexane	2500	U	2500	75	250	NA	4/23/11 14:44		243343	
Styrene	1300	U	1300	88	250	NA	4/23/11 14:44		243343	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/23/11 14:44		243343	
Toluene	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Trichloroethene (TCE)	1100	J	1300	75	250	NA	4/23/11 14:44		243343	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
Vinyl Chloride	750	J	1300	75	250	NA	4/23/11 14:44		243343	
cis-1,2-Dichloroethene	48000		1300	75	250	NA	4/23/11 14:44		243343	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
m,p-Xylenes	1300	U	1300	210	250	NA	4/23/11 14:44		243343	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/23/11 14:44		243343	
o-Xylene	1300	U	1300	100	250	NA	4/23/11 14:44		243343	
trans-1,2-Dichloroethene	850	J	1300	75	250	NA	4/23/11 14:44		243343	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/23/11 14:44		243343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	4/23/11 14:44	
Dibromofluoromethane	110	89-119	4/23/11 14:44	
Toluene-d8	106	87-121	4/23/11 14:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20110419
Lab Code: R1102105-038

Service Request: R1102105
Date Collected: 4/19/11 1020
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 12:24		243805	
Ethene	12		1.0	1	NA	4/27/11 12:24		243805	
Methane	93		2.0	1	NA	4/27/11 12:24		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1020
Date Received: 4/20/11
Date Analyzed: 5/9/11 22:44

Sample Name: LC34-BW0002B-031.5-20110419
Lab Code: R1102105-038

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050911\CC1690.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	18	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110419
Lab Code: R1102105-039

Service Request: R1102105
Date Collected: 4/19/11 1105
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	247		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 19:40	
Carbon, Total Organic (TOC), Average	9060	4.3		mg/L	1.0	1	NA	4/30/11 10:53	
Chloride	300.0	687		mg/L	40	200	NA	4/21/11 12:36	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 19:57	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 19:40	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/21/11 12:36	*
Sulfate	300.0	47.8		mg/L	2.0	10	NA	4/27/11 00:23	
Sulfide, Total	SM 4500-S2- F	0.99	U	mg/L	0.99	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110419
Lab Code: R1102105-039

Service Request: R1102105
Date Collected: 4/19/11 1105
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,1,2,2-Tetrachloroethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,1,2-Trichloroethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	200	500	NA	4/25/11 14:30		243554	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	190	500	NA	4/25/11 14:30		243554	
1,2,4-Trichlorobenzene	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	220	500	NA	4/25/11 14:30		243554	
1,2-Dibromoethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,2-Dichlorobenzene	2500	U	2500	200	500	NA	4/25/11 14:30		243554	
1,2-Dichloroethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
1,2-Dichloropropane	2500	U	2500	330	500	NA	4/25/11 14:30		243554	
1,3-Dichlorobenzene	2500	U	2500	180	500	NA	4/25/11 14:30		243554	
1,4-Dichlorobenzene	2500	U	2500	170	500	NA	4/25/11 14:30		243554	
n-Butanol	25000	U	25000	3400	500	NA	4/25/11 14:30		243554	
2-Butanone (MEK)	5000	U	5000	500	500	NA	4/25/11 14:30		243554	
2-Hexanone	5000	U	5000	200	500	NA	4/25/11 14:30		243554	
4-Methyl-2-pentanone	5000	U	5000	170	500	NA	4/25/11 14:30		243554	
Acetone	10000	U	10000	800	500	NA	4/25/11 14:30		243554	
Benzene	2500	U	2500	160	500	NA	4/25/11 14:30		243554	
Bromodichloromethane	2500	U	2500	210	500	NA	4/25/11 14:30		243554	
Bromoform	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Bromomethane	2500	U	2500	200	500	NA	4/25/11 14:30		243554	
Carbon Disulfide	5000	U	5000	180	500	NA	4/25/11 14:30		243554	
Carbon Tetrachloride	2500	U	2500	180	500	NA	4/25/11 14:30		243554	
Chlorobenzene	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Chloroethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Chloroform	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Chloromethane	2500	U	2500	230	500	NA	4/25/11 14:30		243554	
Cyclohexane	5000	U	5000	150	500	NA	4/25/11 14:30		243554	
Dibromochloromethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	370	500	NA	4/25/11 14:30		243554	
Dichloromethane	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Ethylbenzene	2500	U	2500	210	500	NA	4/25/11 14:30		243554	
Isopropylbenzene (Cumene)	2500	U	2500	170	500	NA	4/25/11 14:30		243554	
Methyl Acetate	5000	U	5000	330	500	NA	4/25/11 14:30		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110419
Lab Code: R1102105-039

Service Request: R1102105
Date Collected: 4/19/11 1105
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Methylcyclohexane	5000	U	5000	150	500	NA	4/25/11 14:30		243554	
Styrene	2500	U	2500	180	500	NA	4/25/11 14:30		243554	
Tetrachloroethene (PCE)	2500	U	2500	210	500	NA	4/25/11 14:30		243554	
Toluene	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Trichloroethene (TCE)	1800	J	2500	150	500	NA	4/25/11 14:30		243554	
Trichlorofluoromethane (CFC 11)	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
Vinyl Chloride	2100	J	2500	150	500	NA	4/25/11 14:30		243554	
cis-1,2-Dichloroethene	74000		2500	150	500	NA	4/25/11 14:30		243554	
cis-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
m,p-Xylenes	2500	U	2500	410	500	NA	4/25/11 14:30		243554	
n-Butyl Acetate	2500	U	2500	150	500	NA	4/25/11 14:30		243554	
o-Xylene	2500	U	2500	200	500	NA	4/25/11 14:30		243554	
trans-1,2-Dichloroethene	490	J	2500	150	500	NA	4/25/11 14:30		243554	
trans-1,3-Dichloropropene	2500	U	2500	150	500	NA	4/25/11 14:30		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	4/25/11 14:30	
Dibromofluoromethane	110	89-119	4/25/11 14:30	
Toluene-d8	108	87-121	4/25/11 14:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110419
Lab Code: R1102105-039

Service Request: R1102105
Date Collected: 4/19/11 1105
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 12:38		243805	
Ethene	8.0		1.0	1	NA	4/27/11 12:38		243805	
Methane	58		2.0	1	NA	4/27/11 12:38		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1105
Date Received: 4/20/11
Date Analyzed: 5/10/11 00:47

Sample Name: LC34-BW0002C-038.5-20110419
Lab Code: R1102105-039

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1692.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	36		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110419
Lab Code: R1102105-040

Service Request: R1102105
Date Collected: 4/19/11 1035
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.3	mg/L	1.0	10	NA	4/26/11 01:32	
Carbon, Total Organic (TOC), Average	9060	4.0	mg/L	1.0	1	NA	4/30/11 11:28	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 20:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002D-045.5-20110419
 Lab Code: R1102105-040

Service Request: R1102105
 Date Collected: 4/19/11 1035
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,1,2,2-Tetrachloroethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,1,2-Trichloroethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	130	U	130	10	25	NA	4/25/11 15:00		243554	
1,1-Dichloroethane (1,1-DCA)	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,1-Dichloroethene (1,1-DCE)	130	U	130	9.3	25	NA	4/25/11 15:00		243554	
1,2,4-Trichlorobenzene	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	11	25	NA	4/25/11 15:00		243554	
1,2-Dibromoethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,2-Dichlorobenzene	130	U	130	10	25	NA	4/25/11 15:00		243554	
1,2-Dichloroethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
1,2-Dichloropropane	130	U	130	17	25	NA	4/25/11 15:00		243554	
1,3-Dichlorobenzene	130	U	130	9.0	25	NA	4/25/11 15:00		243554	
1,4-Dichlorobenzene	130	U	130	8.5	25	NA	4/25/11 15:00		243554	
n-Butanol	1300	U	1300	170	25	NA	4/25/11 15:00		243554	
2-Butanone (MEK)	250	U	250	25	25	NA	4/25/11 15:00		243554	
2-Hexanone	250	U	250	10	25	NA	4/25/11 15:00		243554	
4-Methyl-2-pentanone	250	U	250	8.5	25	NA	4/25/11 15:00		243554	
Acetone	500	U	500	40	25	NA	4/25/11 15:00		243554	
Benzene	130	U	130	7.8	25	NA	4/25/11 15:00		243554	
Bromodichloromethane	130	U	130	11	25	NA	4/25/11 15:00		243554	
Bromoform	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Bromomethane	130	U	130	10	25	NA	4/25/11 15:00		243554	
Carbon Disulfide	250	U	250	8.8	25	NA	4/25/11 15:00		243554	
Carbon Tetrachloride	130	U	130	9.0	25	NA	4/25/11 15:00		243554	
Chlorobenzene	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Chloroethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Chloroform	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Chloromethane	130	U	130	12	25	NA	4/25/11 15:00		243554	
Cyclohexane	250	U	250	7.5	25	NA	4/25/11 15:00		243554	
Dibromochloromethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Dichlorodifluoromethane (CFC 12)	130	U	130	19	25	NA	4/25/11 15:00		243554	
Dichloromethane	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Ethylbenzene	130	U	130	11	25	NA	4/25/11 15:00		243554	
Isopropylbenzene (Cumene)	130	U	130	8.5	25	NA	4/25/11 15:00		243554	
Methyl Acetate	250	U	250	17	25	NA	4/25/11 15:00		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110419
Lab Code: R1102105-040

Service Request: R1102105
Date Collected: 4/19/11 1035
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Methylcyclohexane	250	U	250	7.5	25	NA	4/25/11 15:00		243554	
Styrene	130	U	130	8.8	25	NA	4/25/11 15:00		243554	
Tetrachloroethene (PCE)	130	U	130	11	25	NA	4/25/11 15:00		243554	
Toluene	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Trichloroethene (TCE)	38	J	130	7.5	25	NA	4/25/11 15:00		243554	
Trichlorofluoromethane (CFC 11)	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
Vinyl Chloride	410		130	7.5	25	NA	4/25/11 15:00		243554	
cis-1,2-Dichloroethene	7500	D	500	30	100	NA	4/26/11 20:06		243708	
cis-1,3-Dichloropropene	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
m,p-Xylenes	130	U	130	21	25	NA	4/25/11 15:00		243554	
n-Butyl Acetate	130	U	130	7.5	25	NA	4/25/11 15:00		243554	
o-Xylene	130	U	130	10	25	NA	4/25/11 15:00		243554	
trans-1,2-Dichloroethene	49	J	130	7.5	25	NA	4/25/11 15:00		243554	
trans-1,3-Dichloropropene	130	U	130	7.5	25	NA	4/25/11 15:00		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	4/25/11 15:00	
Dibromofluoromethane	111	89-119	4/25/11 15:00	
Toluene-d8	108	87-121	4/25/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110419
Lab Code: R1102105-040

Service Request: R1102105
Date Collected: 4/19/11 1035
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 13:39		243805	
Ethene	2.9		1.0	1	NA	4/27/11 13:39		243805	
Methane	9.0		2.0	1	NA	4/27/11 13:39		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1035
Date Received: 4/20/11
Date Analyzed: 5/10/11 02:50

Sample Name: LC34-BW0002D-045.5-20110419
Lab Code: R1102105-040

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1694.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	3.3	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110419
Lab Code: R1102105-041

Service Request: R1102105
Date Collected: 4/19/11 1350
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/26/11 01:45	
Carbon, Total Organic (TOC), Average	9060	3.2		mg/L	1.0	1	NA	4/30/11 13:15	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 20:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002E-052.5-20110419
 Lab Code: R1102105-041

Service Request: R1102105
 Date Collected: 4/19/11 1350
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.55	J	5.0	0.40	1	NA	4/25/11 15:30		243554	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/25/11 15:30		243554	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/25/11 15:30		243554	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/25/11 15:30		243554	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/25/11 15:30		243554	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/25/11 15:30		243554	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/25/11 15:30		243554	
n-Butanol	50	U	50	6.7	1	NA	4/25/11 15:30		243554	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/25/11 15:30		243554	
2-Hexanone	10	U	10	0.40	1	NA	4/25/11 15:30		243554	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/25/11 15:30		243554	
Acetone	20	U	20	1.6	1	NA	4/25/11 15:30		243554	
Benzene	5.0	U	5.0	0.31	1	NA	4/25/11 15:30		243554	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/25/11 15:30		243554	
Bromoform	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/25/11 15:30		243554	
Carbon Disulfide	10	U	10	0.35	1	NA	4/25/11 15:30		243554	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/25/11 15:30		243554	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Chloroform	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/25/11 15:30		243554	
Cyclohexane	10	U	10	0.30	1	NA	4/25/11 15:30		243554	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/25/11 15:30		243554	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/25/11 15:30		243554	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/25/11 15:30		243554	
Methyl Acetate	10	U	10	0.66	1	NA	4/25/11 15:30		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110419
Lab Code: R1102105-041

Service Request: R1102105
Date Collected: 4/19/11 1350
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Methylcyclohexane	10	U	10	0.30	1	NA	4/25/11 15:30		243554	
Styrene	5.0	U	5.0	0.35	1	NA	4/25/11 15:30		243554	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/25/11 15:30		243554	
Toluene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Trichloroethene (TCE)	0.64	J	5.0	0.30	1	NA	4/25/11 15:30		243554	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
Vinyl Chloride	2.0	J	5.0	0.30	1	NA	4/25/11 15:30		243554	
cis-1,2-Dichloroethene	19		5.0	0.30	1	NA	4/25/11 15:30		243554	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/25/11 15:30		243554	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/25/11 15:30		243554	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 15:30		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	4/25/11 15:30	
Dibromofluoromethane	111	89-119	4/25/11 15:30	
Toluene-d8	108	87-121	4/25/11 15:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110419
Lab Code: R1102105-041

Service Request: R1102105
Date Collected: 4/19/11 1350
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 13:53		243805	
Ethene	1.0	U	1.0	1	NA	4/27/11 13:53		243805	
Methane	6.8		2.0	1	NA	4/27/11 13:53		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1350
Date Received: 4/20/11
Date Analyzed: 5/10/11 04:53

Sample Name: LC34-BW0002E-052.5-20110419
Lab Code: R1102105-041

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1696.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20110419
Lab Code: R1102105-042

Service Request: R1102105
Date Collected: 4/19/11 1445
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U mg/L	1.0	10	NA	4/26/11 01:58	
Carbon, Total Organic (TOC), Average	9060	3.1	mg/L	1.0	1	NA	4/30/11 13:50	
Iodide	300.0	2.0	U mg/L	2.0	10	NA	5/3/11 20:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002F-059.5-20110419
 Lab Code: R1102105-042

Service Request: R1102105
 Date Collected: 4/19/11 1445
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 15:17		243491	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 15:17		243491	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 15:17		243491	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 15:17		243491	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 15:17		243491	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 15:17		243491	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 15:17		243491	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 15:17		243491	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 15:17		243491	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 15:17		243491	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 15:17		243491	
Acetone	20	U	20	1.6	1	NA	4/26/11 15:17		243491	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 15:17		243491	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 15:17		243491	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 15:17		243491	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 15:17		243491	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 15:17		243491	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 15:17		243491	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 15:17		243491	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 15:17		243491	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 15:17		243491	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 15:17		243491	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 15:17		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20110419
Lab Code: R1102105-042

Service Request: R1102105
Date Collected: 4/19/11 1445
Date Received: 4/20/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 15:17		243491	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 15:17		243491	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 15:17		243491	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Trichloroethene (TCE)	4.7	J	5.0	0.30	1	NA	4/26/11 15:17		243491	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
Vinyl Chloride	67		5.0	0.30	1	NA	4/26/11 15:17		243491	
cis-1,2-Dichloroethene	80		5.0	0.30	1	NA	4/26/11 15:17		243491	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 15:17		243491	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 15:17		243491	
trans-1,2-Dichloroethene	2.1	J	5.0	0.30	1	NA	4/26/11 15:17		243491	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 15:17		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	111	85-122	4/26/11 15:17	
Dibromofluoromethane	112	89-119	4/26/11 15:17	
Toluene-d8	105	87-121	4/26/11 15:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20110419
Lab Code: R1102105-042

Service Request: R1102105
Date Collected: 4/19/11 1445
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 14:22		243805	
Ethene	1.0	U	1.0	1	NA	4/27/11 14:22		243805	
Methane	6.4		2.0	1	NA	4/27/11 14:22		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1445
Date Received: 4/20/11
Date Analyzed: 5/10/11 06:56

Sample Name: LC34-BW0002F-059.5-20110419
Lab Code: R1102105-042

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050911\CC1698.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20110419
Lab Code: R1102105-043

Service Request: R1102105
Date Collected: 4/19/11 1136
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/26/11 02:11	
Carbon, Total Organic (TOC), Average	9060	2.9		mg/L	1.0	1	NA	4/30/11 15:01	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 20:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003A-024.5-20110419
 Lab Code: R1102105-043

Service Request: R1102105
 Date Collected: 4/19/11 1136
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,1,2,2-Tetrachloroethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,1,2-Trichloroethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	1700		1000	80	200	NA	4/25/11 16:30		243554	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	74	200	NA	4/25/11 16:30		243554	
1,2,4-Trichlorobenzene	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	86	200	NA	4/25/11 16:30		243554	
1,2-Dibromoethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,2-Dichlorobenzene	1000	U	1000	80	200	NA	4/25/11 16:30		243554	
1,2-Dichloroethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
1,2-Dichloropropane	1000	U	1000	140	200	NA	4/25/11 16:30		243554	
1,3-Dichlorobenzene	1000	U	1000	72	200	NA	4/25/11 16:30		243554	
1,4-Dichlorobenzene	1000	U	1000	68	200	NA	4/25/11 16:30		243554	
n-Butanol	10000	U	10000	1400	200	NA	4/25/11 16:30		243554	
2-Butanone (MEK)	2000	U	2000	200	200	NA	4/25/11 16:30		243554	
2-Hexanone	2000	U	2000	80	200	NA	4/25/11 16:30		243554	
4-Methyl-2-pentanone	2000	U	2000	68	200	NA	4/25/11 16:30		243554	
Acetone	4000	U	4000	320	200	NA	4/25/11 16:30		243554	
Benzene	1000	U	1000	62	200	NA	4/25/11 16:30		243554	
Bromodichloromethane	1000	U	1000	82	200	NA	4/25/11 16:30		243554	
Bromoform	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Bromomethane	1000	U	1000	80	200	NA	4/25/11 16:30		243554	
Carbon Disulfide	2000	U	2000	70	200	NA	4/25/11 16:30		243554	
Carbon Tetrachloride	1000	U	1000	72	200	NA	4/25/11 16:30		243554	
Chlorobenzene	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Chloroethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Chloroform	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Chloromethane	1000	U	1000	92	200	NA	4/25/11 16:30		243554	
Cyclohexane	2000	U	2000	60	200	NA	4/25/11 16:30		243554	
Dibromochloromethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	150	200	NA	4/25/11 16:30		243554	
Dichloromethane	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Ethylbenzene	1000	U	1000	84	200	NA	4/25/11 16:30		243554	
Isopropylbenzene (Cumene)	1000	U	1000	68	200	NA	4/25/11 16:30		243554	
Methyl Acetate	2000	U	2000	140	200	NA	4/25/11 16:30		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20110419
Lab Code: R1102105-043

Service Request: R1102105
Date Collected: 4/19/11 1136
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Methylcyclohexane	2000	U	2000	60	200	NA	4/25/11 16:30		243554	
Styrene	1000	U	1000	70	200	NA	4/25/11 16:30		243554	
Tetrachloroethene (PCE)	1000	U	1000	84	200	NA	4/25/11 16:30		243554	
Toluene	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Trichloroethene (TCE)	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Trichlorofluoromethane (CFC 11)	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
Vinyl Chloride	5700		1000	60	200	NA	4/25/11 16:30		243554	
cis-1,2-Dichloroethene	45000	D	2500	150	500	NA	4/26/11 20:36		243708	
cis-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
m,p-Xylenes	1000	U	1000	170	200	NA	4/25/11 16:30		243554	
n-Butyl Acetate	1000	U	1000	60	200	NA	4/25/11 16:30		243554	
o-Xylene	1000	U	1000	80	200	NA	4/25/11 16:30		243554	
trans-1,2-Dichloroethene	970	J	1000	60	200	NA	4/25/11 16:30		243554	
trans-1,3-Dichloropropene	1000	U	1000	60	200	NA	4/25/11 16:30		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	4/25/11 16:30	
Dibromofluoromethane	112	89-119	4/25/11 16:30	
Toluene-d8	108	87-121	4/25/11 16:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20110419
Lab Code: R1102105-043

Service Request: R1102105
Date Collected: 4/19/11 1136
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 14:34		243805	
Ethene	110	D	2.0	2	NA	4/27/11 15:13		243805	
Methane	94		2.0	1	NA	4/27/11 14:34		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1136
Date Received: 4/20/11
Date Analyzed: 5/10/11 10:00

Sample Name: LC34-BW0003A-024.5-20110419
Lab Code: R1102105-043

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1701.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003B-031.5-20110419
 Lab Code: R1102105-044

Service Request: R1102105
 Date Collected: 4/19/11 1323
 Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/26/11 02:25	
Carbon, Total Organic (TOC), Average	9060	3.3		mg/L	1.0	1	NA	4/30/11 16:11	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 21:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003B-031.5-20110419
 Lab Code: R1102105-044

Service Request: R1102105
 Date Collected: 4/19/11 1323
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,1,2,2-Tetrachloroethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,1,2-Trichloroethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	96 J	500	40	100	NA	4/25/11 17:00		243554	
1,1-Dichloroethane (1,1-DCA)	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,1-Dichloroethene (1,1-DCE)	500 U	500	37	100	NA	4/25/11 17:00		243554	
1,2,4-Trichlorobenzene	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	43	100	NA	4/25/11 17:00		243554	
1,2-Dibromoethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,2-Dichlorobenzene	500 U	500	40	100	NA	4/25/11 17:00		243554	
1,2-Dichloroethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
1,2-Dichloropropane	500 U	500	66	100	NA	4/25/11 17:00		243554	
1,3-Dichlorobenzene	500 U	500	36	100	NA	4/25/11 17:00		243554	
1,4-Dichlorobenzene	500 U	500	34	100	NA	4/25/11 17:00		243554	
n-Butanol	5000 U	5000	670	100	NA	4/25/11 17:00		243554	
2-Butanone (MEK)	1000 U	1000	100	100	NA	4/25/11 17:00		243554	
2-Hexanone	1000 U	1000	40	100	NA	4/25/11 17:00		243554	
4-Methyl-2-pentanone	1000 U	1000	34	100	NA	4/25/11 17:00		243554	
Acetone	2000 U	2000	160	100	NA	4/25/11 17:00		243554	
Benzene	500 U	500	31	100	NA	4/25/11 17:00		243554	
Bromodichloromethane	500 U	500	41	100	NA	4/25/11 17:00		243554	
Bromoform	500 U	500	30	100	NA	4/25/11 17:00		243554	
Bromomethane	500 U	500	40	100	NA	4/25/11 17:00		243554	
Carbon Disulfide	1000 U	1000	35	100	NA	4/25/11 17:00		243554	
Carbon Tetrachloride	500 U	500	36	100	NA	4/25/11 17:00		243554	
Chlorobenzene	500 U	500	30	100	NA	4/25/11 17:00		243554	
Chloroethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
Chloroform	500 U	500	30	100	NA	4/25/11 17:00		243554	
Chloromethane	500 U	500	46	100	NA	4/25/11 17:00		243554	
Cyclohexane	1000 U	1000	30	100	NA	4/25/11 17:00		243554	
Dibromochloromethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
Dichlorodifluoromethane (CFC 12)	500 U	500	73	100	NA	4/25/11 17:00		243554	
Dichloromethane	500 U	500	30	100	NA	4/25/11 17:00		243554	
Ethylbenzene	500 U	500	42	100	NA	4/25/11 17:00		243554	
Isopropylbenzene (Cumene)	500 U	500	34	100	NA	4/25/11 17:00		243554	
Methyl Acetate	1000 U	1000	66	100	NA	4/25/11 17:00		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20110419
Lab Code: R1102105-044

Service Request: R1102105
Date Collected: 4/19/11 1323
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	30	100	NA	4/25/11 17:00		243554	
Methylcyclohexane	1000	U	1000	30	100	NA	4/25/11 17:00		243554	
Styrene	500	U	500	35	100	NA	4/25/11 17:00		243554	
Tetrachloroethene (PCE)	500	U	500	42	100	NA	4/25/11 17:00		243554	
Toluene	500	U	500	30	100	NA	4/25/11 17:00		243554	
Trichloroethene (TCE)	500	U	500	30	100	NA	4/25/11 17:00		243554	
Trichlorofluoromethane (CFC 11)	500	U	500	30	100	NA	4/25/11 17:00		243554	
Vinyl Chloride	5500		500	30	100	NA	4/25/11 17:00		243554	
cis-1,2-Dichloroethene	46000	D	1300	75	250	NA	4/26/11 21:06		243708	
cis-1,3-Dichloropropene	500	U	500	30	100	NA	4/25/11 17:00		243554	
m,p-Xylenes	500	U	500	81	100	NA	4/25/11 17:00		243554	
n-Butyl Acetate	500	U	500	30	100	NA	4/25/11 17:00		243554	
o-Xylene	500	U	500	40	100	NA	4/25/11 17:00		243554	
trans-1,2-Dichloroethene	600		500	30	100	NA	4/25/11 17:00		243554	
trans-1,3-Dichloropropene	500	U	500	30	100	NA	4/25/11 17:00		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	4/25/11 17:00	
Dibromofluoromethane	113	89-119	4/25/11 17:00	
Toluene-d8	108	87-121	4/25/11 17:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20110419
Lab Code: R1102105-044

Service Request: R1102105
Date Collected: 4/19/11 1323
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 15:30		243805	
Ethene	160	D	2.5	2.5	NA	4/27/11 15:43		243805	
Methane	97		2.0	1	NA	4/27/11 15:30		243805	

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Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Collected: 4/19/11 1323
 Date Received: 4/20/11
 Date Analyzed: 5/10/11 12:03

Sample Name: LC34-BW0003B-031.5-20110419
 Lab Code: R1102105-044

Units: mg/L
 Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
 Data File Name: J:\ACQUDATA\HPLC03\DATA\050911\CC1703.D\

Analysis Lot: 245199
 Instrument Name: R-HPLC-03
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003B-031.5-20110419-D
 Lab Code: R1102105-045

Service Request: R1102105
 Date Collected: 4/19/11 1323
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,1,2,2-Tetrachloroethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,1,2-Trichloroethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	220	J	500	40	100	NA	4/25/11 17:30		243554	
1,1-Dichloroethane (1,1-DCA)	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,1-Dichloroethene (1,1-DCE)	44	J	500	37	100	NA	4/25/11 17:30		243554	
1,2,4-Trichlorobenzene	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	43	100	NA	4/25/11 17:30		243554	
1,2-Dibromoethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,2-Dichlorobenzene	500	U	500	40	100	NA	4/25/11 17:30		243554	
1,2-Dichloroethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
1,2-Dichloropropane	500	U	500	66	100	NA	4/25/11 17:30		243554	
1,3-Dichlorobenzene	500	U	500	36	100	NA	4/25/11 17:30		243554	
1,4-Dichlorobenzene	500	U	500	34	100	NA	4/25/11 17:30		243554	
n-Butanol	5000	U	5000	670	100	NA	4/25/11 17:30		243554	
2-Butanone (MEK)	1000	U	1000	100	100	NA	4/25/11 17:30		243554	
2-Hexanone	1000	U	1000	40	100	NA	4/25/11 17:30		243554	
4-Methyl-2-pentanone	1000	U	1000	34	100	NA	4/25/11 17:30		243554	
Acetone	2000	U	2000	160	100	NA	4/25/11 17:30		243554	
Benzene	500	U	500	31	100	NA	4/25/11 17:30		243554	
Bromodichloromethane	500	U	500	41	100	NA	4/25/11 17:30		243554	
Bromoform	500	U	500	30	100	NA	4/25/11 17:30		243554	
Bromomethane	500	U	500	40	100	NA	4/25/11 17:30		243554	
Carbon Disulfide	1000	U	1000	35	100	NA	4/25/11 17:30		243554	
Carbon Tetrachloride	500	U	500	36	100	NA	4/25/11 17:30		243554	
Chlorobenzene	500	U	500	30	100	NA	4/25/11 17:30		243554	
Chloroethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
Chloroform	500	U	500	30	100	NA	4/25/11 17:30		243554	
Chloromethane	500	U	500	46	100	NA	4/25/11 17:30		243554	
Cyclohexane	1000	U	1000	30	100	NA	4/25/11 17:30		243554	
Dibromochloromethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
Dichlorodifluoromethane (CFC 12)	500	U	500	73	100	NA	4/25/11 17:30		243554	
Dichloromethane	500	U	500	30	100	NA	4/25/11 17:30		243554	
Ethylbenzene	500	U	500	42	100	NA	4/25/11 17:30		243554	
Isopropylbenzene (Cumene)	500	U	500	34	100	NA	4/25/11 17:30		243554	
Methyl Acetate	1000	U	1000	66	100	NA	4/25/11 17:30		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1323
Date Received: 4/20/11

Sample Name: LC34-BW0003B-031.5-20110419-D
Lab Code: R1102105-045

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	30	100	NA	4/25/11 17:30		243554	
Methylcyclohexane	1000	U	1000	30	100	NA	4/25/11 17:30		243554	
Styrene	500	U	500	35	100	NA	4/25/11 17:30		243554	
Tetrachloroethene (PCE)	500	U	500	42	100	NA	4/25/11 17:30		243554	
Toluene	500	U	500	30	100	NA	4/25/11 17:30		243554	
Trichloroethene (TCE)	500	U	500	30	100	NA	4/25/11 17:30		243554	
Trichlorofluoromethane (CFC 11)	500	U	500	30	100	NA	4/25/11 17:30		243554	
Vinyl Chloride	9500		500	30	100	NA	4/25/11 17:30		243554	
cis-1,2-Dichloroethene	52000	D	2500	150	500	NA	4/26/11 21:37		243708	
cis-1,3-Dichloropropene	500	U	500	30	100	NA	4/25/11 17:30		243554	
m,p-Xylenes	500	U	500	81	100	NA	4/25/11 17:30		243554	
n-Butyl Acetate	500	U	500	30	100	NA	4/25/11 17:30		243554	
o-Xylene	500	U	500	40	100	NA	4/25/11 17:30		243554	
trans-1,2-Dichloroethene	1000		500	30	100	NA	4/25/11 17:30		243554	
trans-1,3-Dichloropropene	500	U	500	30	100	NA	4/25/11 17:30		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	4/25/11 17:30	
Dibromofluoromethane	112	89-119	4/25/11 17:30	
Toluene-d8	109	87-121	4/25/11 17:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110419
Lab Code: R1102105-046

Service Request: R1102105
Date Collected: 4/19/11 1443
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	279		mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 19:53	
Carbon, Total Organic (TOC), Average	9060	3.8		mg/L	1.0	1	NA	4/30/11 16:47	
Chloride	300.0	490		mg/L	40	200	NA	4/21/11 12:49	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 22:47	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 19:53	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/21/11 12:49	
Sulfate	300.0	34.0		mg/L	2.0	10	NA	4/27/11 01:03	
Sulfide, Total	SM 4500-S2- F	0.98	U	mg/L	0.98	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110419
 Lab Code: R1102105-046

Service Request: R1102105
 Date Collected: 4/19/11 1443
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,1,2,2-Tetrachloroethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,1,2-Trichloroethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	20	50	NA	4/25/11 18:00		243554	
1,1-Dichloroethane (1,1-DCA)	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,1-Dichloroethene (1,1-DCE)	250	U	250	19	50	NA	4/25/11 18:00		243554	
1,2,4-Trichlorobenzene	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	50	NA	4/25/11 18:00		243554	
1,2-Dibromoethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,2-Dichlorobenzene	250	U	250	20	50	NA	4/25/11 18:00		243554	
1,2-Dichloroethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
1,2-Dichloropropane	250	U	250	33	50	NA	4/25/11 18:00		243554	
1,3-Dichlorobenzene	250	U	250	18	50	NA	4/25/11 18:00		243554	
1,4-Dichlorobenzene	250	U	250	17	50	NA	4/25/11 18:00		243554	
n-Butanol	2500	U	2500	340	50	NA	4/25/11 18:00		243554	
2-Butanone (MEK)	500	U	500	50	50	NA	4/25/11 18:00		243554	
2-Hexanone	500	U	500	20	50	NA	4/25/11 18:00		243554	
4-Methyl-2-pentanone	500	U	500	17	50	NA	4/25/11 18:00		243554	
Acetone	1000	U	1000	80	50	NA	4/25/11 18:00		243554	
Benzene	250	U	250	16	50	NA	4/25/11 18:00		243554	
Bromodichloromethane	250	U	250	21	50	NA	4/25/11 18:00		243554	
Bromoform	250	U	250	15	50	NA	4/25/11 18:00		243554	
Bromomethane	250	U	250	20	50	NA	4/25/11 18:00		243554	
Carbon Disulfide	500	U	500	18	50	NA	4/25/11 18:00		243554	
Carbon Tetrachloride	250	U	250	18	50	NA	4/25/11 18:00		243554	
Chlorobenzene	250	U	250	15	50	NA	4/25/11 18:00		243554	
Chloroethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
Chloroform	250	U	250	15	50	NA	4/25/11 18:00		243554	
Chloromethane	250	U	250	23	50	NA	4/25/11 18:00		243554	
Cyclohexane	500	U	500	15	50	NA	4/25/11 18:00		243554	
Dibromochloromethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
Dichlorodifluoromethane (CFC 12)	250	U	250	37	50	NA	4/25/11 18:00		243554	
Dichloromethane	250	U	250	15	50	NA	4/25/11 18:00		243554	
Ethylbenzene	250	U	250	21	50	NA	4/25/11 18:00		243554	
Isopropylbenzene (Cumene)	250	U	250	17	50	NA	4/25/11 18:00		243554	
Methyl Acetate	500	U	500	33	50	NA	4/25/11 18:00		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110419
Lab Code: R1102105-046

Service Request: R1102105
Date Collected: 4/19/11 1443
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	4/25/11 18:00		243554	
Methylcyclohexane	500	U	500	15	50	NA	4/25/11 18:00		243554	
Styrene	250	U	250	18	50	NA	4/25/11 18:00		243554	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	4/25/11 18:00		243554	
Toluene	250	U	250	15	50	NA	4/25/11 18:00		243554	
Trichloroethene (TCE)	250	U	250	15	50	NA	4/25/11 18:00		243554	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	4/25/11 18:00		243554	
Vinyl Chloride	4500		250	15	50	NA	4/25/11 18:00		243554	
cis-1,2-Dichloroethene	6000		250	15	50	NA	4/25/11 18:00		243554	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	4/25/11 18:00		243554	
m,p-Xylenes	250	U	250	41	50	NA	4/25/11 18:00		243554	
n-Butyl Acetate	250	U	250	15	50	NA	4/25/11 18:00		243554	
o-Xylene	250	U	250	20	50	NA	4/25/11 18:00		243554	
trans-1,2-Dichloroethene	120	J	250	15	50	NA	4/25/11 18:00		243554	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	4/25/11 18:00		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	4/25/11 18:00	
Dibromofluoromethane	113	89-119	4/25/11 18:00	
Toluene-d8	110	87-121	4/25/11 18:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110419
Lab Code: R1102105-046

Service Request: R1102105
Date Collected: 4/19/11 1443
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 15:53		243805	
Ethene	260	D	5.0	5	NA	4/27/11 16:04		243805	
Methane	96		2.0	1	NA	4/27/11 15:53		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1443
Date Received: 4/20/11
Date Analyzed: 5/10/11 14:06

Sample Name: LC34-BW0003C-038.5-20110419
Lab Code: R1102105-046

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1705.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	8.1	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110419
Lab Code: R1102105-047

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.3		mg/L	1.0	10	NA	4/26/11 02:38	
Carbon, Total Organic (TOC), Average	9060	4.1		mg/L	1.0	1	NA	4/30/11 17:22	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 22:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110419
Lab Code: R1102105-047

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,1,2,2-Tetrachloroethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,1,2-Trichloroethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	20	50	NA	4/26/11 15:44		243491	
1,1-Dichloroethane (1,1-DCA)	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,1-Dichloroethene (1,1-DCE)	250	U	250	19	50	NA	4/26/11 15:44		243491	
1,2,4-Trichlorobenzene	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	50	NA	4/26/11 15:44		243491	
1,2-Dibromoethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,2-Dichlorobenzene	250	U	250	20	50	NA	4/26/11 15:44		243491	
1,2-Dichloroethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
1,2-Dichloropropane	250	U	250	33	50	NA	4/26/11 15:44		243491	
1,3-Dichlorobenzene	250	U	250	18	50	NA	4/26/11 15:44		243491	
1,4-Dichlorobenzene	250	U	250	17	50	NA	4/26/11 15:44		243491	
n-Butanol	2500	U	2500	340	50	NA	4/26/11 15:44		243491	
2-Butanone (MEK)	500	U	500	50	50	NA	4/26/11 15:44		243491	
2-Hexanone	500	U	500	20	50	NA	4/26/11 15:44		243491	
4-Methyl-2-pentanone	500	U	500	17	50	NA	4/26/11 15:44		243491	
Acetone	1000	U	1000	80	50	NA	4/26/11 15:44		243491	
Benzene	250	U	250	16	50	NA	4/26/11 15:44		243491	
Bromodichloromethane	250	U	250	21	50	NA	4/26/11 15:44		243491	
Bromoform	250	U	250	15	50	NA	4/26/11 15:44		243491	
Bromomethane	250	U	250	20	50	NA	4/26/11 15:44		243491	
Carbon Disulfide	500	U	500	18	50	NA	4/26/11 15:44		243491	
Carbon Tetrachloride	250	U	250	18	50	NA	4/26/11 15:44		243491	
Chlorobenzene	250	U	250	15	50	NA	4/26/11 15:44		243491	
Chloroethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
Chloroform	250	U	250	15	50	NA	4/26/11 15:44		243491	
Chloromethane	250	U	250	23	50	NA	4/26/11 15:44		243491	
Cyclohexane	500	U	500	15	50	NA	4/26/11 15:44		243491	
Dibromochloromethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
Dichlorodifluoromethane (CFC 12)	250	U	250	37	50	NA	4/26/11 15:44		243491	
Dichloromethane	250	U	250	15	50	NA	4/26/11 15:44		243491	
Ethylbenzene	250	U	250	21	50	NA	4/26/11 15:44		243491	
Isopropylbenzene (Cumene)	250	U	250	17	50	NA	4/26/11 15:44		243491	
Methyl Acetate	500	U	500	33	50	NA	4/26/11 15:44		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110419
Lab Code: R1102105-047

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	4/26/11 15:44		243491	
Methylcyclohexane	500	U	500	15	50	NA	4/26/11 15:44		243491	
Styrene	250	U	250	18	50	NA	4/26/11 15:44		243491	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	4/26/11 15:44		243491	
Toluene	250	U	250	15	50	NA	4/26/11 15:44		243491	
Trichloroethene (TCE)	650		250	15	50	NA	4/26/11 15:44		243491	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	4/26/11 15:44		243491	
Vinyl Chloride	400		250	15	50	NA	4/26/11 15:44		243491	
cis-1,2-Dichloroethene	6800		250	15	50	NA	4/26/11 15:44		243491	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	4/26/11 15:44		243491	
m,p-Xylenes	250	U	250	41	50	NA	4/26/11 15:44		243491	
n-Butyl Acetate	250	U	250	15	50	NA	4/26/11 15:44		243491	
o-Xylene	250	U	250	20	50	NA	4/26/11 15:44		243491	
trans-1,2-Dichloroethene	33	J	250	15	50	NA	4/26/11 15:44		243491	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	4/26/11 15:44		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/26/11 15:44	
Dibromofluoromethane	108	89-119	4/26/11 15:44	
Toluene-d8	106	87-121	4/26/11 15:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110419
Lab Code: R1102105-047

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 16:18		243805	
Ethene	4.5		1.0	1	NA	4/27/11 16:18		243805	
Methane	44		2.0	1	NA	4/27/11 16:18		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11
Date Analyzed: 5/10/11 16:08

Sample Name: LC34-BW0003D-045.5-20110419
Lab Code: R1102105-047

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1707.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	4.8	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003D-045.5-20110419-D
 Lab Code: R1102105-048

Service Request: R1102105
 Date Collected: 4/19/11 1245
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,1,2,2-Tetrachloroethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,1,2-Trichloroethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	20	50	NA	4/26/11 16:11		243491	
1,1-Dichloroethane (1,1-DCA)	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,1-Dichloroethene (1,1-DCE)	250	U	250	19	50	NA	4/26/11 16:11		243491	
1,2,4-Trichlorobenzene	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	22	50	NA	4/26/11 16:11		243491	
1,2-Dibromoethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,2-Dichlorobenzene	250	U	250	20	50	NA	4/26/11 16:11		243491	
1,2-Dichloroethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
1,2-Dichloropropane	250	U	250	33	50	NA	4/26/11 16:11		243491	
1,3-Dichlorobenzene	250	U	250	18	50	NA	4/26/11 16:11		243491	
1,4-Dichlorobenzene	250	U	250	17	50	NA	4/26/11 16:11		243491	
n-Butanol	2500	U	2500	340	50	NA	4/26/11 16:11		243491	
2-Butanone (MEK)	500	U	500	50	50	NA	4/26/11 16:11		243491	
2-Hexanone	500	U	500	20	50	NA	4/26/11 16:11		243491	
4-Methyl-2-pentanone	500	U	500	17	50	NA	4/26/11 16:11		243491	
Acetone	1000	U	1000	80	50	NA	4/26/11 16:11		243491	
Benzene	250	U	250	16	50	NA	4/26/11 16:11		243491	
Bromodichloromethane	250	U	250	21	50	NA	4/26/11 16:11		243491	
Bromoform	250	U	250	15	50	NA	4/26/11 16:11		243491	
Bromomethane	250	U	250	20	50	NA	4/26/11 16:11		243491	
Carbon Disulfide	500	U	500	18	50	NA	4/26/11 16:11		243491	
Carbon Tetrachloride	250	U	250	18	50	NA	4/26/11 16:11		243491	
Chlorobenzene	250	U	250	15	50	NA	4/26/11 16:11		243491	
Chloroethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
Chloroform	250	U	250	15	50	NA	4/26/11 16:11		243491	
Chloromethane	250	U	250	23	50	NA	4/26/11 16:11		243491	
Cyclohexane	500	U	500	15	50	NA	4/26/11 16:11		243491	
Dibromochloromethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
Dichlorodifluoromethane (CFC 12)	250	U	250	37	50	NA	4/26/11 16:11		243491	
Dichloromethane	250	U	250	15	50	NA	4/26/11 16:11		243491	
Ethylbenzene	250	U	250	21	50	NA	4/26/11 16:11		243491	
Isopropylbenzene (Cumene)	250	U	250	17	50	NA	4/26/11 16:11		243491	
Methyl Acetate	500	U	500	33	50	NA	4/26/11 16:11		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110419-D
Lab Code: R1102105-048

Service Request: R1102105
Date Collected: 4/19/11 1245
Date Received: 4/20/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	15	50	NA	4/26/11 16:11		243491	
Methylcyclohexane	500	U	500	15	50	NA	4/26/11 16:11		243491	
Styrene	250	U	250	18	50	NA	4/26/11 16:11		243491	
Tetrachloroethene (PCE)	250	U	250	21	50	NA	4/26/11 16:11		243491	
Toluene	250	U	250	15	50	NA	4/26/11 16:11		243491	
Trichloroethene (TCE)	500		250	15	50	NA	4/26/11 16:11		243491	
Trichlorofluoromethane (CFC 11)	250	U	250	15	50	NA	4/26/11 16:11		243491	
Vinyl Chloride	340		250	15	50	NA	4/26/11 16:11		243491	
cis-1,2-Dichloroethene	5700		250	15	50	NA	4/26/11 16:11		243491	
cis-1,3-Dichloropropene	250	U	250	15	50	NA	4/26/11 16:11		243491	
m,p-Xylenes	250	U	250	41	50	NA	4/26/11 16:11		243491	
n-Butyl Acetate	250	U	250	15	50	NA	4/26/11 16:11		243491	
o-Xylene	250	U	250	20	50	NA	4/26/11 16:11		243491	
trans-1,2-Dichloroethene	27	J	250	15	50	NA	4/26/11 16:11		243491	
trans-1,3-Dichloropropene	250	U	250	15	50	NA	4/26/11 16:11		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/26/11 16:11	
Dibromofluoromethane	108	89-119	4/26/11 16:11	
Toluene-d8	106	87-121	4/26/11 16:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110419
Lab Code: R1102105-049

Service Request: R1102105
Date Collected: 4/19/11 1406
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.3		mg/L	1.0	10	NA	4/26/11 03:31	
Carbon, Total Organic (TOC), Average	9060	3.4		mg/L	1.0	1	NA	5/2/11 13:30	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	5/3/11 22:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110419
Lab Code: R1102105-049

Service Request: R1102105
Date Collected: 4/19/11 1406
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 16:38		243491	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 16:38		243491	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 16:38		243491	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 16:38		243491	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 16:38		243491	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 16:38		243491	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 16:38		243491	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 16:38		243491	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 16:38		243491	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 16:38		243491	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 16:38		243491	
Acetone	20	U	20	1.6	1	NA	4/26/11 16:38		243491	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 16:38		243491	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 16:38		243491	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 16:38		243491	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 16:38		243491	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 16:38		243491	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 16:38		243491	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 16:38		243491	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 16:38		243491	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 16:38		243491	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 16:38		243491	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 16:38		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110419
Lab Code: R1102105-049

Service Request: R1102105
Date Collected: 4/19/11 1406
Date Received: 4/20/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 16:38		243491	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 16:38		243491	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 16:38		243491	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
cis-1,2-Dichloroethene	0.72	J	5.0	0.30	1	NA	4/26/11 16:38		243491	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 16:38		243491	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 16:38		243491	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 16:38		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	113	85-122	4/26/11 16:38	
Dibromofluoromethane	112	89-119	4/26/11 16:38	
Toluene-d8	109	87-121	4/26/11 16:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110419
Lab Code: R1102105-049

Service Request: R1102105
Date Collected: 4/19/11 1406
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243960

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/28/11 11:58		243960	
Ethene	1.0	U	1.0	1	NA	4/28/11 11:58		243960	
Methane	6.5		2.0	1	NA	4/28/11 11:58		243960	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1406
Date Received: 4/20/11
Date Analyzed: 5/10/11 18:11

Sample Name: LC34-BW0003E-052.5-20110419
Lab Code: R1102105-049

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC03\DATA\050911\CC1709.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20110419
Lab Code: R1102105-050

Service Request: R1102105
Date Collected: 4/19/11 1519
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.4	mg/L	1.0	10	NA	4/26/11 03:44	
Carbon, Total Organic (TOC), Average	9060	3.2	mg/L	1.0	1	NA	5/2/11 14:05	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	5/3/11 22:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003F-059.5-20110419
 Lab Code: R1102105-050

Service Request: R1102105
 Date Collected: 4/19/11 1519
 Date Received: 4/20/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 17:06		243491	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 17:06		243491	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 17:06		243491	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 17:06		243491	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 17:06		243491	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 17:06		243491	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 17:06		243491	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 17:06		243491	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 17:06		243491	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 17:06		243491	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 17:06		243491	
Acetone	20	U	20	1.6	1	NA	4/26/11 17:06		243491	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 17:06		243491	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 17:06		243491	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 17:06		243491	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 17:06		243491	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 17:06		243491	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 17:06		243491	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 17:06		243491	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 17:06		243491	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 17:06		243491	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 17:06		243491	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 17:06		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20110419
Lab Code: R1102105-050

Service Request: R1102105
Date Collected: 4/19/11 1519
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 17:06		243491	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 17:06		243491	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 17:06		243491	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
Vinyl Chloride	0.39	J	5.0	0.30	1	NA	4/26/11 17:06		243491	
cis-1,2-Dichloroethene	0.94	J	5.0	0.30	1	NA	4/26/11 17:06		243491	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 17:06		243491	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 17:06		243491	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 17:06		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/26/11 17:06	
Dibromofluoromethane	108	89-119	4/26/11 17:06	
Toluene-d8	104	87-121	4/26/11 17:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20110419
Lab Code: R1102105-050

Service Request: R1102105
Date Collected: 4/19/11 1519
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243960

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0 U	1.0	1	NA	4/28/11 12:06		243960	
Ethene	1.0 U	1.0	1	NA	4/28/11 12:06		243960	
Methane	7.0	2.0	1	NA	4/28/11 12:06		243960	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11 1519
Date Received: 4/20/11
Date Analyzed: 5/10/11 21:15

Sample Name: LC34-BW0003F-059.5-20110419
Lab Code: R1102105-050

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1712.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110419-01
 Lab Code: R1102105-051

Service Request: R1102105
 Date Collected: 4/19/11
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,1,2,2-Tetrachloroethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,1,2-Trichloroethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	9800		1300	100	250	NA	4/26/11 17:33		243491	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	93	250	NA	4/26/11 17:33		243491	
1,2,4-Trichlorobenzene	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	110	250	NA	4/26/11 17:33		243491	
1,2-Dibromoethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,2-Dichlorobenzene	1300	U	1300	100	250	NA	4/26/11 17:33		243491	
1,2-Dichloroethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
1,2-Dichloropropane	1300	U	1300	170	250	NA	4/26/11 17:33		243491	
1,3-Dichlorobenzene	1300	U	1300	90	250	NA	4/26/11 17:33		243491	
1,4-Dichlorobenzene	1300	U	1300	85	250	NA	4/26/11 17:33		243491	
n-Butanol	13000	U	13000	1700	250	NA	4/26/11 17:33		243491	
2-Butanone (MEK)	2500	U	2500	250	250	NA	4/26/11 17:33		243491	
2-Hexanone	2500	U	2500	100	250	NA	4/26/11 17:33		243491	
4-Methyl-2-pentanone	2500	U	2500	85	250	NA	4/26/11 17:33		243491	
Acetone	5000	U	5000	400	250	NA	4/26/11 17:33		243491	
Benzene	1300	U	1300	78	250	NA	4/26/11 17:33		243491	
Bromodichloromethane	1300	U	1300	110	250	NA	4/26/11 17:33		243491	
Bromoform	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Bromomethane	1300	U	1300	100	250	NA	4/26/11 17:33		243491	
Carbon Disulfide	2500	U	2500	88	250	NA	4/26/11 17:33		243491	
Carbon Tetrachloride	1300	U	1300	90	250	NA	4/26/11 17:33		243491	
Chlorobenzene	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Chloroethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Chloroform	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Chloromethane	1300	U	1300	120	250	NA	4/26/11 17:33		243491	
Cyclohexane	2500	U	2500	75	250	NA	4/26/11 17:33		243491	
Dibromochloromethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	190	250	NA	4/26/11 17:33		243491	
Dichloromethane	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Ethylbenzene	1300	U	1300	110	250	NA	4/26/11 17:33		243491	
Isopropylbenzene (Cumene)	1300	U	1300	85	250	NA	4/26/11 17:33		243491	
Methyl Acetate	2500	U	2500	170	250	NA	4/26/11 17:33		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-01
Lab Code: R1102105-051

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Methylcyclohexane	2500	U	2500	75	250	NA	4/26/11 17:33		243491	
Styrene	1300	U	1300	88	250	NA	4/26/11 17:33		243491	
Tetrachloroethene (PCE)	1300	U	1300	110	250	NA	4/26/11 17:33		243491	
Toluene	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Trichloroethene (TCE)	140	J	1300	75	250	NA	4/26/11 17:33		243491	
Trichlorofluoromethane (CFC 11)	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
Vinyl Chloride	1800		1300	75	250	NA	4/26/11 17:33		243491	
cis-1,2-Dichloroethene	38000		1300	75	250	NA	4/26/11 17:33		243491	
cis-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
m,p-Xylenes	1300	U	1300	210	250	NA	4/26/11 17:33		243491	
n-Butyl Acetate	1300	U	1300	75	250	NA	4/26/11 17:33		243491	
o-Xylene	1300	U	1300	100	250	NA	4/26/11 17:33		243491	
trans-1,2-Dichloroethene	790	J	1300	75	250	NA	4/26/11 17:33		243491	
trans-1,3-Dichloropropene	1300	U	1300	75	250	NA	4/26/11 17:33		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/26/11 17:33	
Dibromofluoromethane	108	89-119	4/26/11 17:33	
Toluene-d8	104	87-121	4/26/11 17:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Date Analyzed: 5/10/11 23:18

Sample Name: LC34-FD-20110419-02
Lab Code: R1102105-052

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC03\DATA\050911\CC1714.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	2.4	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-03
Lab Code: R1102105-053

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243960

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/28/11 12:47		243960	
Ethene	32		1.0	1	NA	4/28/11 12:47		243960	
Methane	80		2.0	1	NA	4/28/11 12:47		243960	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-04
Lab Code: R1102105-054

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	4.0		mg/L	1.0	1	NA	5/2/11 14:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-05
Lab Code: R1102105-055

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfide, Total	SM 4500-S2- F	0.99 U	mg/L	0.99	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-06
Lab Code: R1102105-056

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	648		mg/L	40	200	NA	4/21/11 12:23	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	4/20/11 19:00	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	4/21/11 12:23	*
Sulfate	300.0	92.3		mg/L	2.0	10	NA	4/21/11 13:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-07
Lab Code: R1102105-057

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	171		mg/L	2.0	1	NA	4/29/11 08:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-08
Lab Code: R1102105-058

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 22:07	
Iron, Dissolved	6010C	100	U	µg/L	100	1	4/27/11	4/30/11 22:07	
Manganese, Dissolved	6010C	14		µg/L	10	1	4/27/11	4/30/11 22:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Date Analyzed: 5/11/11 01:21

Sample Name: LC34-FD-20110419-09
Lab Code: R1102105-059

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC03\DATA\050911\CC1716.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	3.3	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110419-10
 Lab Code: R1102105-060

Service Request: R1102105
 Date Collected: 4/19/11
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,1,2,2-Tetrachloroethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,1,2-Trichloroethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	130	U	130	10	25	NA	4/26/11 18:00		243491	
1,1-Dichloroethane (1,1-DCA)	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,1-Dichloroethene (1,1-DCE)	130	U	130	9.3	25	NA	4/26/11 18:00		243491	
1,2,4-Trichlorobenzene	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	11	25	NA	4/26/11 18:00		243491	
1,2-Dibromoethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,2-Dichlorobenzene	130	U	130	10	25	NA	4/26/11 18:00		243491	
1,2-Dichloroethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
1,2-Dichloropropane	130	U	130	17	25	NA	4/26/11 18:00		243491	
1,3-Dichlorobenzene	130	U	130	9.0	25	NA	4/26/11 18:00		243491	
1,4-Dichlorobenzene	130	U	130	8.5	25	NA	4/26/11 18:00		243491	
n-Butanol	1300	U	1300	170	25	NA	4/26/11 18:00		243491	
2-Butanone (MEK)	250	U	250	25	25	NA	4/26/11 18:00		243491	
2-Hexanone	250	U	250	10	25	NA	4/26/11 18:00		243491	
4-Methyl-2-pentanone	250	U	250	8.5	25	NA	4/26/11 18:00		243491	
Acetone	500	U	500	40	25	NA	4/26/11 18:00		243491	
Benzene	130	U	130	7.8	25	NA	4/26/11 18:00		243491	
Bromodichloromethane	130	U	130	11	25	NA	4/26/11 18:00		243491	
Bromoform	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Bromomethane	130	U	130	10	25	NA	4/26/11 18:00		243491	
Carbon Disulfide	250	U	250	8.8	25	NA	4/26/11 18:00		243491	
Carbon Tetrachloride	130	U	130	9.0	25	NA	4/26/11 18:00		243491	
Chlorobenzene	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Chloroethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Chloroform	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Chloromethane	130	U	130	12	25	NA	4/26/11 18:00		243491	
Cyclohexane	250	U	250	7.5	25	NA	4/26/11 18:00		243491	
Dibromochloromethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Dichlorodifluoromethane (CFC 12)	130	U	130	19	25	NA	4/26/11 18:00		243491	
Dichloromethane	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Ethylbenzene	130	U	130	11	25	NA	4/26/11 18:00		243491	
Isopropylbenzene (Cumene)	130	U	130	8.5	25	NA	4/26/11 18:00		243491	
Methyl Acetate	250	U	250	17	25	NA	4/26/11 18:00		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-10
Lab Code: R1102105-060

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Methylcyclohexane	250	U	250	7.5	25	NA	4/26/11 18:00		243491	
Styrene	130	U	130	8.8	25	NA	4/26/11 18:00		243491	
Tetrachloroethene (PCE)	130	U	130	11	25	NA	4/26/11 18:00		243491	
Toluene	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Trichloroethene (TCE)	44	J	130	7.5	25	NA	4/26/11 18:00		243491	
Trichlorofluoromethane (CFC 11)	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
Vinyl Chloride	360		130	7.5	25	NA	4/26/11 18:00		243491	
cis-1,2-Dichloroethene	7900	D	250	15	50	NA	4/27/11 11:56		243847	*
cis-1,3-Dichloropropene	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
m,p-Xylenes	130	U	130	21	25	NA	4/26/11 18:00		243491	
n-Butyl Acetate	130	U	130	7.5	25	NA	4/26/11 18:00		243491	
o-Xylene	130	U	130	10	25	NA	4/26/11 18:00		243491	
trans-1,2-Dichloroethene	49	J	130	7.5	25	NA	4/26/11 18:00		243491	
trans-1,3-Dichloropropene	130	U	130	7.5	25	NA	4/26/11 18:00		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/26/11 18:00	
Dibromofluoromethane	108	89-119	4/26/11 18:00	
Toluene-d8	104	87-121	4/26/11 18:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-11
Lab Code: R1102105-061

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243960

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/28/11 12:58		243960	
Ethene	4.3		1.0	1	NA	4/28/11 12:58		243960	
Methane	43		2.0	1	NA	4/28/11 12:58		243960	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-12
Lab Code: R1102105-062

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060	3.2		mg/L	1.0	1	NA	5/2/11 15:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110419-13
 Lab Code: R1102105-063

Service Request: R1102105
 Date Collected: 4/19/11
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 18:27		243491	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 18:27		243491	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 18:27		243491	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 18:27		243491	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 18:27		243491	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 18:27		243491	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 18:27		243491	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 18:27		243491	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 18:27		243491	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 18:27		243491	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 18:27		243491	
Acetone	20	U	20	1.6	1	NA	4/26/11 18:27		243491	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 18:27		243491	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 18:27		243491	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 18:27		243491	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 18:27		243491	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 18:27		243491	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 18:27		243491	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 18:27		243491	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 18:27		243491	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 18:27		243491	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 18:27		243491	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 18:27		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110419-13
Lab Code: R1102105-063

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 18:27		243491	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 18:27		243491	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 18:27		243491	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Trichloroethene (TCE)	5.3		5.0	0.30	1	NA	4/26/11 18:27		243491	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
Vinyl Chloride	38		5.0	0.30	1	NA	4/26/11 18:27		243491	
cis-1,2-Dichloroethene	58		5.0	0.30	1	NA	4/26/11 18:27		243491	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 18:27		243491	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 18:27		243491	
trans-1,2-Dichloroethene	1.4	J	5.0	0.30	1	NA	4/26/11 18:27		243491	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 18:27		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/26/11 18:27	
Dibromofluoromethane	110	89-119	4/26/11 18:27	
Toluene-d8	105	87-121	4/26/11 18:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110419-01
 Lab Code: R1102105-064

Service Request: R1102105
 Date Collected: 4/19/11
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243450

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/23/11 15:06		243450	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/23/11 15:06		243450	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/23/11 15:06		243450	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/23/11 15:06		243450	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/23/11 15:06		243450	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/23/11 15:06		243450	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/23/11 15:06		243450	
n-Butanol	50	U	50	6.7	1	NA	4/23/11 15:06		243450	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/23/11 15:06		243450	
2-Hexanone	10	U	10	0.40	1	NA	4/23/11 15:06		243450	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/23/11 15:06		243450	
Acetone	20	U	20	1.6	1	NA	4/23/11 15:06		243450	
Benzene	5.0	U	5.0	0.31	1	NA	4/23/11 15:06		243450	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/23/11 15:06		243450	
Bromoform	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/23/11 15:06		243450	
Carbon Disulfide	10	U	10	0.35	1	NA	4/23/11 15:06		243450	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/23/11 15:06		243450	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Chloroform	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/23/11 15:06		243450	
Cyclohexane	10	U	10	0.30	1	NA	4/23/11 15:06		243450	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/23/11 15:06		243450	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/23/11 15:06		243450	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/23/11 15:06		243450	
Methyl Acetate	10	U	10	0.66	1	NA	4/23/11 15:06		243450	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110419-01
Lab Code: R1102105-064

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243450

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Methylcyclohexane	10	U	10	0.30	1	NA	4/23/11 15:06		243450	
Styrene	5.0	U	5.0	0.35	1	NA	4/23/11 15:06		243450	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/23/11 15:06		243450	
Toluene	0.45	J	5.0	0.30	1	NA	4/23/11 15:06		243450	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/23/11 15:06		243450	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/23/11 15:06		243450	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 15:06		243450	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	4/23/11 15:06	
Dibromofluoromethane	109	89-119	4/23/11 15:06	
Toluene-d8	108	87-121	4/23/11 15:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110419-02
 Lab Code: R1102105-065

Service Request: R1102105
 Date Collected: 4/19/11
 Date Received: 4/20/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/25/11 13:31		243554	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/25/11 13:31		243554	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/25/11 13:31		243554	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/25/11 13:31		243554	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/25/11 13:31		243554	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/25/11 13:31		243554	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/25/11 13:31		243554	
n-Butanol	50	U	50	6.7	1	NA	4/25/11 13:31		243554	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/25/11 13:31		243554	
2-Hexanone	10	U	10	0.40	1	NA	4/25/11 13:31		243554	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/25/11 13:31		243554	
Acetone	20	U	20	1.6	1	NA	4/25/11 13:31		243554	
Benzene	5.0	U	5.0	0.31	1	NA	4/25/11 13:31		243554	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/25/11 13:31		243554	
Bromoform	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/25/11 13:31		243554	
Carbon Disulfide	10	U	10	0.35	1	NA	4/25/11 13:31		243554	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/25/11 13:31		243554	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Chloroform	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/25/11 13:31		243554	
Cyclohexane	10	U	10	0.30	1	NA	4/25/11 13:31		243554	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/25/11 13:31		243554	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/25/11 13:31		243554	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/25/11 13:31		243554	
Methyl Acetate	10	U	10	0.66	1	NA	4/25/11 13:31		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110419-02
Lab Code: R1102105-065

Service Request: R1102105
Date Collected: 4/19/11
Date Received: 4/20/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Methylcyclohexane	10	U	10	0.30	1	NA	4/25/11 13:31		243554	
Styrene	5.0	U	5.0	0.35	1	NA	4/25/11 13:31		243554	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/25/11 13:31		243554	
Toluene	0.38	J	5.0	0.30	1	NA	4/25/11 13:31		243554	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/25/11 13:31		243554	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/25/11 13:31		243554	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 13:31		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	4/25/11 13:31	
Dibromofluoromethane	107	89-119	4/25/11 13:31	
Toluene-d8	109	87-121	4/25/11 13:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB1

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	4/26/11 10:24	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	4/19/11 19:45	
Carbon, Total Organic (TOC), Average	9060	1.0	U	mg/L	1.0	1	NA	4/29/11 15:26	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	4/19/11 19:45	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	5/3/11 13:36	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	4/19/11 19:45	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	4/19/11 19:45	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	4/19/11 19:45	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	4/22/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB2

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	4/29/11 08:45	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	4/20/11 15:54	
Carbon, Total Organic (TOC), Average	9060	1.0	U	mg/L	1.0	1	NA	4/30/11 05:35	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	4/20/11 09:53	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	5/3/11 19:18	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	4/20/11 15:54	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	4/20/11 09:53	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	4/20/11 15:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB3

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	4/25/11 21:46	
Carbon, Total Organic (TOC), Average	9060	1.0 U	mg/L	1.0	1	NA	5/2/11 12:19	
Chloride	300.0	0.20 U	mg/L	0.20	1	NA	4/21/11 11:16	
Nitrite as Nitrogen	300.0	0.10 U	mg/L	0.10	1	NA	4/21/11 11:16	
Sulfate	300.0	0.20 U	mg/L	0.20	1	NA	4/21/11 11:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB4

Service Request: R1102105
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	4/26/11 03:05	
Sulfate	300.0	0.20 U	mg/L	0.20	1	NA	4/22/11 03:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB5

Service Request: R1102105
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	4/26/11 22:11	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	4/26/11 22:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB6

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfate	300.0	0.20 U	mg/L	0.20	1	NA	4/29/11 21:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB1

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/21/11	4/26/11 22:12	
Iron, Dissolved	6010C	100	U	µg/L	100	1	4/21/11	4/26/11 22:12	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	4/21/11	4/26/11 22:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB2

Service Request: R1102105
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 19:39	
Iron, Dissolved	6010C	100	U	µg/L	100	1	4/27/11	4/30/11 19:39	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 19:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1102105-MB3

Service Request: R1102105
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 20:07	
Iron, Dissolved	6010C	100	U	µg/L	100	1	4/27/11	4/30/11 20:07	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	4/27/11	4/30/11 20:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103598-04

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/21/11 12:02		243226	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/21/11 12:02		243226	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/21/11 12:02		243226	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/21/11 12:02		243226	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/21/11 12:02		243226	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/21/11 12:02		243226	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/21/11 12:02		243226	
n-Butanol	50	U	50	6.7	1	NA	4/21/11 12:02		243226	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/21/11 12:02		243226	
2-Hexanone	10	U	10	0.40	1	NA	4/21/11 12:02		243226	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/21/11 12:02		243226	
Acetone	20	U	20	1.6	1	NA	4/21/11 12:02		243226	
Benzene	5.0	U	5.0	0.31	1	NA	4/21/11 12:02		243226	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/21/11 12:02		243226	
Bromoform	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/21/11 12:02		243226	
Carbon Disulfide	10	U	10	0.35	1	NA	4/21/11 12:02		243226	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/21/11 12:02		243226	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Chloroform	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/21/11 12:02		243226	
Cyclohexane	10	U	10	0.30	1	NA	4/21/11 12:02		243226	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/21/11 12:02		243226	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/21/11 12:02		243226	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/21/11 12:02		243226	
Methyl Acetate	10	U	10	0.66	1	NA	4/21/11 12:02		243226	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103598-04

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243226

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Methylcyclohexane	10	U	10	0.30	1	NA	4/21/11 12:02		243226	
Styrene	5.0	U	5.0	0.35	1	NA	4/21/11 12:02		243226	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/21/11 12:02		243226	
Toluene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/21/11 12:02		243226	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/21/11 12:02		243226	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/21/11 12:02		243226	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	4/21/11 12:02	
Dibromofluoromethane	108	89-119	4/21/11 12:02	
Toluene-d8	110	87-121	4/21/11 12:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103556-03

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/22/11 11:45		243340	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/22/11 11:45		243340	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/22/11 11:45		243340	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/22/11 11:45		243340	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/22/11 11:45		243340	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/22/11 11:45		243340	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/22/11 11:45		243340	
n-Butanol	50	U	50	6.7	1	NA	4/22/11 11:45		243340	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/22/11 11:45		243340	
2-Hexanone	10	U	10	0.40	1	NA	4/22/11 11:45		243340	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/22/11 11:45		243340	
Acetone	20	U	20	1.6	1	NA	4/22/11 11:45		243340	
Benzene	5.0	U	5.0	0.31	1	NA	4/22/11 11:45		243340	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/22/11 11:45		243340	
Bromoform	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/22/11 11:45		243340	
Carbon Disulfide	10	U	10	0.35	1	NA	4/22/11 11:45		243340	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/22/11 11:45		243340	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Chloroform	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/22/11 11:45		243340	
Cyclohexane	10	U	10	0.30	1	NA	4/22/11 11:45		243340	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/22/11 11:45		243340	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/22/11 11:45		243340	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/22/11 11:45		243340	
Methyl Acetate	10	U	10	0.66	1	NA	4/22/11 11:45		243340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103556-03

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243340

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Methylcyclohexane	10	U	10	0.30	1	NA	4/22/11 11:45		243340	
Styrene	5.0	U	5.0	0.35	1	NA	4/22/11 11:45		243340	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/22/11 11:45		243340	
Toluene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/22/11 11:45		243340	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/22/11 11:45		243340	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/22/11 11:45		243340	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/22/11 11:45	
Dibromofluoromethane	109	89-119	4/22/11 11:45	
Toluene-d8	104	87-121	4/22/11 11:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103557-03

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/23/11 13:23		243343	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/23/11 13:23		243343	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/23/11 13:23		243343	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/23/11 13:23		243343	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/23/11 13:23		243343	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/23/11 13:23		243343	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/23/11 13:23		243343	
n-Butanol	50	U	50	6.7	1	NA	4/23/11 13:23		243343	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/23/11 13:23		243343	
2-Hexanone	10	U	10	0.40	1	NA	4/23/11 13:23		243343	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/23/11 13:23		243343	
Acetone	20	U	20	1.6	1	NA	4/23/11 13:23		243343	
Benzene	5.0	U	5.0	0.31	1	NA	4/23/11 13:23		243343	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/23/11 13:23		243343	
Bromoform	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/23/11 13:23		243343	
Carbon Disulfide	10	U	10	0.35	1	NA	4/23/11 13:23		243343	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/23/11 13:23		243343	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Chloroform	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/23/11 13:23		243343	
Cyclohexane	10	U	10	0.30	1	NA	4/23/11 13:23		243343	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/23/11 13:23		243343	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/23/11 13:23		243343	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/23/11 13:23		243343	
Methyl Acetate	10	U	10	0.66	1	NA	4/23/11 13:23		243343	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103557-03

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243343

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Methylcyclohexane	10	U	10	0.30	1	NA	4/23/11 13:23		243343	
Styrene	5.0	U	5.0	0.35	1	NA	4/23/11 13:23		243343	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/23/11 13:23		243343	
Toluene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/23/11 13:23		243343	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/23/11 13:23		243343	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 13:23		243343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	4/23/11 13:23	
Dibromofluoromethane	107	89-119	4/23/11 13:23	
Toluene-d8	105	87-121	4/23/11 13:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103581-01

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243450

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/23/11 14:36		243450	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/23/11 14:36		243450	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/23/11 14:36		243450	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/23/11 14:36		243450	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/23/11 14:36		243450	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/23/11 14:36		243450	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/23/11 14:36		243450	
n-Butanol	50	U	50	6.7	1	NA	4/23/11 14:36		243450	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/23/11 14:36		243450	
2-Hexanone	10	U	10	0.40	1	NA	4/23/11 14:36		243450	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/23/11 14:36		243450	
Acetone	20	U	20	1.6	1	NA	4/23/11 14:36		243450	
Benzene	5.0	U	5.0	0.31	1	NA	4/23/11 14:36		243450	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/23/11 14:36		243450	
Bromoform	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/23/11 14:36		243450	
Carbon Disulfide	10	U	10	0.35	1	NA	4/23/11 14:36		243450	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/23/11 14:36		243450	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Chloroform	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/23/11 14:36		243450	
Cyclohexane	10	U	10	0.30	1	NA	4/23/11 14:36		243450	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/23/11 14:36		243450	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/23/11 14:36		243450	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/23/11 14:36		243450	
Methyl Acetate	10	U	10	0.66	1	NA	4/23/11 14:36		243450	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103581-01

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243450

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Methylcyclohexane	10	U	10	0.30	1	NA	4/23/11 14:36		243450	
Styrene	5.0	U	5.0	0.35	1	NA	4/23/11 14:36		243450	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/23/11 14:36		243450	
Toluene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/23/11 14:36		243450	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/23/11 14:36		243450	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/23/11 14:36		243450	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	4/23/11 14:36	
Dibromofluoromethane	109	89-119	4/23/11 14:36	
Toluene-d8	108	87-121	4/23/11 14:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103576-09

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/25/11 10:32		243441	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/25/11 10:32		243441	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/25/11 10:32		243441	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/25/11 10:32		243441	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/25/11 10:32		243441	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/25/11 10:32		243441	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/25/11 10:32		243441	
n-Butanol	50	U	50	6.7	1	NA	4/25/11 10:32		243441	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/25/11 10:32		243441	
2-Hexanone	10	U	10	0.40	1	NA	4/25/11 10:32		243441	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/25/11 10:32		243441	
Acetone	20	U	20	1.6	1	NA	4/25/11 10:32		243441	
Benzene	5.0	U	5.0	0.31	1	NA	4/25/11 10:32		243441	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/25/11 10:32		243441	
Bromoform	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/25/11 10:32		243441	
Carbon Disulfide	10	U	10	0.35	1	NA	4/25/11 10:32		243441	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/25/11 10:32		243441	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Chloroform	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/25/11 10:32		243441	
Cyclohexane	10	U	10	0.30	1	NA	4/25/11 10:32		243441	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/25/11 10:32		243441	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/25/11 10:32		243441	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/25/11 10:32		243441	
Methyl Acetate	10	U	10	0.66	1	NA	4/25/11 10:32		243441	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103576-09

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243441

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Methylcyclohexane	10	U	10	0.30	1	NA	4/25/11 10:32		243441	
Styrene	5.0	U	5.0	0.35	1	NA	4/25/11 10:32		243441	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/25/11 10:32		243441	
Toluene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/25/11 10:32		243441	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/25/11 10:32		243441	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 10:32		243441	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	4/25/11 10:32	
Dibromofluoromethane	107	89-119	4/25/11 10:32	
Toluene-d8	105	87-121	4/25/11 10:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103801-01

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/25/11 11:00		243554	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/25/11 11:00		243554	
1,2,4-Trichlorobenzene	0.44	J	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/25/11 11:00		243554	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/25/11 11:00		243554	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/25/11 11:00		243554	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/25/11 11:00		243554	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/25/11 11:00		243554	
n-Butanol	50	U	50	6.7	1	NA	4/25/11 11:00		243554	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/25/11 11:00		243554	
2-Hexanone	10	U	10	0.40	1	NA	4/25/11 11:00		243554	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/25/11 11:00		243554	
Acetone	20	U	20	1.6	1	NA	4/25/11 11:00		243554	
Benzene	5.0	U	5.0	0.31	1	NA	4/25/11 11:00		243554	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/25/11 11:00		243554	
Bromoform	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/25/11 11:00		243554	
Carbon Disulfide	10	U	10	0.35	1	NA	4/25/11 11:00		243554	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/25/11 11:00		243554	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Chloroform	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/25/11 11:00		243554	
Cyclohexane	10	U	10	0.30	1	NA	4/25/11 11:00		243554	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/25/11 11:00		243554	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/25/11 11:00		243554	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/25/11 11:00		243554	
Methyl Acetate	10	U	10	0.66	1	NA	4/25/11 11:00		243554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103801-01

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243554

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Methylcyclohexane	10	U	10	0.30	1	NA	4/25/11 11:00		243554	
Styrene	5.0	U	5.0	0.35	1	NA	4/25/11 11:00		243554	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/25/11 11:00		243554	
Toluene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/25/11 11:00		243554	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/25/11 11:00		243554	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/25/11 11:00		243554	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	4/25/11 11:00	
Dibromofluoromethane	110	89-119	4/25/11 11:00	
Toluene-d8	109	87-121	4/25/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103593-09

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 11:12		243491	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 11:12		243491	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 11:12		243491	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 11:12		243491	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 11:12		243491	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 11:12		243491	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 11:12		243491	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 11:12		243491	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 11:12		243491	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 11:12		243491	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 11:12		243491	
Acetone	20	U	20	1.6	1	NA	4/26/11 11:12		243491	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 11:12		243491	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 11:12		243491	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 11:12		243491	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 11:12		243491	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 11:12		243491	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 11:12		243491	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 11:12		243491	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 11:12		243491	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 11:12		243491	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 11:12		243491	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 11:12		243491	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103593-09

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243491

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 11:12		243491	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 11:12		243491	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 11:12		243491	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 11:12		243491	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 11:12		243491	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 11:12		243491	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	110	85-122	4/26/11 11:12	
Dibromofluoromethane	110	89-119	4/26/11 11:12	
Toluene-d8	106	87-121	4/26/11 11:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103699-04

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243708

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/26/11 19:36		243708	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/26/11 19:36		243708	
1,2,4-Trichlorobenzene	0.35	J	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/26/11 19:36		243708	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/26/11 19:36		243708	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/26/11 19:36		243708	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/26/11 19:36		243708	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/26/11 19:36		243708	
n-Butanol	50	U	50	6.7	1	NA	4/26/11 19:36		243708	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/26/11 19:36		243708	
2-Hexanone	10	U	10	0.40	1	NA	4/26/11 19:36		243708	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/26/11 19:36		243708	
Acetone	20	U	20	1.6	1	NA	4/26/11 19:36		243708	
Benzene	5.0	U	5.0	0.31	1	NA	4/26/11 19:36		243708	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/26/11 19:36		243708	
Bromoform	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/26/11 19:36		243708	
Carbon Disulfide	10	U	10	0.35	1	NA	4/26/11 19:36		243708	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/26/11 19:36		243708	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Chloroform	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/26/11 19:36		243708	
Cyclohexane	10	U	10	0.30	1	NA	4/26/11 19:36		243708	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/26/11 19:36		243708	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/26/11 19:36		243708	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/26/11 19:36		243708	
Methyl Acetate	10	U	10	0.66	1	NA	4/26/11 19:36		243708	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103699-04

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243708

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Methylcyclohexane	10	U	10	0.30	1	NA	4/26/11 19:36		243708	
Styrene	5.0	U	5.0	0.35	1	NA	4/26/11 19:36		243708	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/26/11 19:36		243708	
Toluene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/26/11 19:36		243708	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/26/11 19:36		243708	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/26/11 19:36		243708	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	4/26/11 19:36	
Dibromofluoromethane	106	89-119	4/26/11 19:36	
Toluene-d8	107	87-121	4/26/11 19:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103723-03

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243847

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,1,2-Trichloroethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.40	1	NA	4/27/11 10:46		243847	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.37	1	NA	4/27/11 10:46		243847	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.43	1	NA	4/27/11 10:46		243847	
1,2-Dibromoethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,2-Dichlorobenzene	5.0	U	5.0	0.40	1	NA	4/27/11 10:46		243847	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
1,2-Dichloropropane	5.0	U	5.0	0.66	1	NA	4/27/11 10:46		243847	
1,3-Dichlorobenzene	5.0	U	5.0	0.36	1	NA	4/27/11 10:46		243847	
1,4-Dichlorobenzene	5.0	U	5.0	0.34	1	NA	4/27/11 10:46		243847	
n-Butanol	50	U	50	6.7	1	NA	4/27/11 10:46		243847	
2-Butanone (MEK)	10	U	10	1.0	1	NA	4/27/11 10:46		243847	
2-Hexanone	10	U	10	0.40	1	NA	4/27/11 10:46		243847	
4-Methyl-2-pentanone	10	U	10	0.34	1	NA	4/27/11 10:46		243847	
Acetone	20	U	20	1.6	1	NA	4/27/11 10:46		243847	
Benzene	5.0	U	5.0	0.31	1	NA	4/27/11 10:46		243847	
Bromodichloromethane	5.0	U	5.0	0.41	1	NA	4/27/11 10:46		243847	
Bromoform	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Bromomethane	5.0	U	5.0	0.40	1	NA	4/27/11 10:46		243847	
Carbon Disulfide	10	U	10	0.35	1	NA	4/27/11 10:46		243847	
Carbon Tetrachloride	5.0	U	5.0	0.36	1	NA	4/27/11 10:46		243847	
Chlorobenzene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Chloroethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Chloroform	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Chloromethane	5.0	U	5.0	0.46	1	NA	4/27/11 10:46		243847	
Cyclohexane	10	U	10	0.30	1	NA	4/27/11 10:46		243847	
Dibromochloromethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.73	1	NA	4/27/11 10:46		243847	
Dichloromethane	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Ethylbenzene	5.0	U	5.0	0.42	1	NA	4/27/11 10:46		243847	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.34	1	NA	4/27/11 10:46		243847	
Methyl Acetate	10	U	10	0.66	1	NA	4/27/11 10:46		243847	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103723-03

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analysis Lot: 243847

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Methylcyclohexane	10	U	10	0.30	1	NA	4/27/11 10:46		243847	
Styrene	5.0	U	5.0	0.35	1	NA	4/27/11 10:46		243847	
Tetrachloroethene (PCE)	5.0	U	5.0	0.42	1	NA	4/27/11 10:46		243847	
Toluene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Trichloroethene (TCE)	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
Vinyl Chloride	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
cis-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
cis-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
m,p-Xylenes	5.0	U	5.0	0.81	1	NA	4/27/11 10:46		243847	
n-Butyl Acetate	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
o-Xylene	5.0	U	5.0	0.40	1	NA	4/27/11 10:46		243847	
trans-1,2-Dichloroethene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	
trans-1,3-Dichloropropene	5.0	U	5.0	0.30	1	NA	4/27/11 10:46		243847	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	4/27/11 10:46	
Dibromofluoromethane	110	89-119	4/27/11 10:46	
Toluene-d8	104	87-121	4/27/11 10:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1103472-01

Service Request: R1102105
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243146

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/22/11 10:14		243146	
Ethene	1.0	U	1.0	1	NA	4/22/11 10:14		243146	
Methane	2.0	U	2.0	1	NA	4/22/11 10:14		243146	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103670-01

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243684

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/26/11 12:24		243684	
Ethene	1.0	U	1.0	1	NA	4/26/11 12:24		243684	
Methane	2.0	U	2.0	1	NA	4/26/11 12:24		243684	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103704-01

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243805

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	4/27/11 10:24		243805	
Ethene	1.0	U	1.0	1	NA	4/27/11 10:24		243805	
Methane	2.0	U	2.0	1	NA	4/27/11 10:24		243805	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1103813-01

Service Request: R1102105
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analysis Lot: 243960

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0 U	1.0	1	NA	4/28/11 11:05		243960	
Ethene	1.0 U	1.0	1	NA	4/28/11 11:05		243960	
Methane	2.0 U	2.0	1	NA	4/28/11 11:05		243960	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: NA
Date Received: NA
Date Analyzed: 5/5/11 19:28

Sample Name: Method Blank
Lab Code: RQ1103475-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUADATA\HPLC03\DATA\050511\C1635.D\

Analysis Lot: 243151
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Collected: NA
Date Received: NA
Date Analyzed: 5/7/11 23:55

Sample Name: Method Blank
Lab Code: RQ1104219-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC03\DATA\050711\C1667.D\

Analysis Lot: 245199
Instrument Name: R-HPLC-03
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/22/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS1			Duplicate Lab Control Sample R1102105-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.30	6.3	100	6.14	6.3	98	56 - 138	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/19/11 -
 5/3/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS2			
		Result	Spike Amount	% Rec	% Rec Limits
Bromide	300.0	1.03	1.00	103	90 - 110
Chloride	300.0	2.07	2.00	103	90 - 110
Iodide	300.0	0.935	1.00	94	90 - 110
Nitrate as Nitrogen	300.0	1.06	1.00	106	90 - 110
Sulfate	300.0	2.03	2.00	101	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.1	20.0	96	72 - 115
Carbon, Total Organic (TOC), Average	9060	9.33	10.0	93	86 - 117
Nitrite as Nitrogen	300.0	0.996	1.00	100	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/20/11 -
 5/ 3/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.04	1.00	104	90 - 110
Chloride	300.0	2.05	2.00	102	90 - 110
Iodide	300.0	0.945	1.00	95	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110
Sulfate	300.0	2.06	2.00	103	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.0	20.0	95	72 - 115
Carbon, Total Organic (TOC), Average	9060	9.86	10.0	99	86 - 117
Nitrite as Nitrogen	300.0	0.974	1.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/21/11 -
 5/ 2/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS4			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.05	1.00	105	90 - 110
Chloride	300.0	2.05	2.00	103	90 - 110
Sulfate	300.0	2.07	2.00	103	90 - 110
Carbon, Total Organic (TOC), Average	9060	9.60	10.0	96	86 - 117
Nitrite as Nitrogen	300.0	0.983	1.00	98	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/22/11 -
4/26/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS5			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Sulfate	300.0	2.05	2.00	102	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/26/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1102105-LCS6			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.03	1.00	103	90 - 110
Sulfate	300.0	1.92	2.00	96	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/29/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample		% Rec	% Rec Limits
		Result	Spike Amount		
Sulfate	300.0	1.96	2.00	98	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/26/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Lab Control Sample
 R1102105-LCS1

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	37.1	40	93	80 - 120
Iron, Dissolved	6010C	990	1000	99	80 - 120
Manganese, Dissolved	6010C	506	500	101	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/30/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Lab Control Sample R1102105-LCS2					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	6010C	38.0	40	95	80 - 120
Iron, Dissolved	6010C	1040	1000	104	80 - 120
Manganese, Dissolved	6010C	493	500	99	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/21/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243226

Lab Control Sample
 RQ1103598-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.8	20.0	84	72 - 128
1,1,2,2-Tetrachloroethane	19.5	20.0	98	72 - 131
1,1,2-Trichloroethane	20.3	20.0	101	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.8	20.0	79	71 - 134
1,1-Dichloroethane (1,1-DCA)	18.3	20.0	92	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.4	20.0	82	72 - 129
1,2,4-Trichlorobenzene	19.8	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.5	20.0	97	62 - 131
1,2-Dibromoethane	20.3	20.0	101	78 - 125
1,2-Dichlorobenzene	18.7	20.0	93	79 - 124
1,2-Dichloroethane	21.4	20.0	107	78 - 126
1,2-Dichloropropane	18.9	20.0	95	80 - 123
1,3-Dichlorobenzene	17.9	20.0	89	78 - 124
1,4-Dichlorobenzene	18.4	20.0	92	78 - 123
n-Butanol	755	1000	75	70 - 130
2-Butanone (MEK)	20.0	20.0	100	60 - 133
2-Hexanone	17.7	20.0	88	61 - 131
4-Methyl-2-pentanone	19.3	20.0	96	61 - 132
Acetone	17.7	20.0	88	59 - 140
Benzene	18.1	20.0	91	78 - 121
Bromodichloromethane	19.2	20.0	96	80 - 125
Bromoform	18.2	20.0	91	73 - 132
Bromomethane	16.8	20.0	84	57 - 144
Carbon Disulfide	20.5	20.0	102	59 - 138
Carbon Tetrachloride	15.4	20.0	77	69 - 135
Chlorobenzene	18.8	20.0	94	80 - 121
Chloroethane	19.2	20.0	96	71 - 130
Chloroform	18.4	20.0	92	78 - 125
Chloromethane	18.5	20.0	93	62 - 133
Cyclohexane	15.6	20.0	78	67 - 127
Dibromochloromethane	19.2	20.0	96	78 - 133
Dichlorodifluoromethane (CFC 12)	17.0	20.0	85	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/21/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243226

**Lab Control Sample
 RQ1103598-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.1	20.0	91	75 - 125
Ethylbenzene	17.4	20.0	87	78 - 123
Isopropylbenzene (Cumene)	19.0	20.0	95	73 - 133
Methyl Acetate	20.8	20.0	104	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	15.9	20.0	80	64 - 133
Styrene	18.4	20.0	92	80 - 132
Tetrachloroethene (PCE)	17.3	20.0	86	72 - 131
Toluene	18.4	20.0	92	78 - 122
Trichloroethene (TCE)	17.8	20.0	89	74 - 127
Trichlorofluoromethane (CFC 11)	18.3	20.0	91	71 - 139
Vinyl Chloride	18.3	20.0	91	71 - 136
cis-1,2-Dichloroethene	18.5	20.0	92	78 - 122
cis-1,3-Dichloropropene	17.9	20.0	90	77 - 125
m,p-Xylenes	36.1	40.0	90	79 - 126
n-Butyl Acetate	17.6	20.0	88	54 - 127
o-Xylene	18.1	20.0	90	79 - 126
trans-1,2-Dichloroethene	16.7	20.0	84	75 - 121
trans-1,3-Dichloropropene	18.0	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/22/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243340

Lab Control Sample
 RQ1103556-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	22.5	20.0	112	72 - 128
1,1,2,2-Tetrachloroethane	20.9	20.0	104	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.7	20.0	98	71 - 134
1,1-Dichloroethane (1,1-DCA)	23.8	20.0	119	76 - 122
1,1-Dichloroethene (1,1-DCE)	20.8	20.0	104	72 - 129
1,2,4-Trichlorobenzene	20.5	20.0	102	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.3	20.0	92	62 - 131
1,2-Dibromoethane	20.7	20.0	104	78 - 125
1,2-Dichlorobenzene	19.5	20.0	98	79 - 124
1,2-Dichloroethane	24.6	20.0	123	78 - 126
1,2-Dichloropropane	20.4	20.0	102	80 - 123
1,3-Dichlorobenzene	20.3	20.0	102	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	1060	1000	106	70 - 130
2-Butanone (MEK)	24.2	20.0	121	60 - 133
2-Hexanone	19.4	20.0	97	61 - 131
4-Methyl-2-pentanone	19.6	20.0	98	61 - 132
Acetone	20.2	20.0	101	59 - 140
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	22.0	20.0	110	80 - 125
Bromoform	20.1	20.0	100	73 - 132
Bromomethane	19.4	20.0	97	57 - 144
Carbon Disulfide	20.1	20.0	101	59 - 138
Carbon Tetrachloride	21.0	20.0	105	69 - 135
Chlorobenzene	20.5	20.0	103	80 - 121
Chloroethane	22.2	20.0	111	71 - 130
Chloroform	23.3	20.0	117	78 - 125
Chloromethane	24.1	20.0	121	62 - 133
Cyclohexane	19.4	20.0	97	67 - 127
Dibromochloromethane	20.1	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	21.5	20.0	107	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/22/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243340

**Lab Control Sample
 RQ1103556-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.6	20.0	103	75 - 125
Ethylbenzene	21.1	20.0	105	78 - 123
Isopropylbenzene (Cumene)	23.7	20.0	119	73 - 133
Methyl Acetate	22.4	20.0	112	57 - 157
Methyl tert-Butyl Ether	21.9	20.0	110	75 - 126
Methylcyclohexane	19.5	20.0	97	64 - 133
Styrene	20.9	20.0	105	80 - 132
Tetrachloroethene (PCE)	20.3	20.0	101	72 - 131
Toluene	20.5	20.0	102	78 - 122
Trichloroethene (TCE)	20.7	20.0	104	74 - 127
Trichlorofluoromethane (CFC 11)	24.6	20.0	123	71 - 139
Vinyl Chloride	24.8	20.0	124	71 - 136
cis-1,2-Dichloroethene	22.3	20.0	111	78 - 122
cis-1,3-Dichloropropene	19.9	20.0	100	77 - 125
m,p-Xylenes	41.8	40.0	105	79 - 126
n-Butyl Acetate	18.6	20.0	93	54 - 127
o-Xylene	20.3	20.0	102	79 - 126
trans-1,2-Dichloroethene	21.3	20.0	107	75 - 121
trans-1,3-Dichloropropene	20.3	20.0	102	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/23/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243343

**Lab Control Sample
 RQ1103557-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.7	20.0	109	72 - 128
1,1,2,2-Tetrachloroethane	20.2	20.0	101	72 - 131
1,1,2-Trichloroethane	20.0	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.5	20.0	93	71 - 134
1,1-Dichloroethane (1,1-DCA)	22.7	20.0	114	76 - 122
1,1-Dichloroethene (1,1-DCE)	19.7	20.0	98	72 - 129
1,2,4-Trichlorobenzene	20.3	20.0	102	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.5	20.0	87	62 - 131
1,2-Dibromoethane	20.0	20.0	100	78 - 125
1,2-Dichlorobenzene	20.1	20.0	100	79 - 124
1,2-Dichloroethane	23.0	20.0	115	78 - 126
1,2-Dichloropropane	19.6	20.0	98	80 - 123
1,3-Dichlorobenzene	19.8	20.0	99	78 - 124
1,4-Dichlorobenzene	20.3	20.0	101	78 - 123
n-Butanol	1110	1000	111	70 - 130
2-Butanone (MEK)	24.8	20.0	124	60 - 133
2-Hexanone	20.6	20.0	103	61 - 131
4-Methyl-2-pentanone	18.9	20.0	95	61 - 132
Acetone	23.1	20.0	116	59 - 140
Benzene	19.5	20.0	97	78 - 121
Bromodichloromethane	21.5	20.0	107	80 - 125
Bromoform	18.6	20.0	93	73 - 132
Bromomethane	20.1	20.0	101	57 - 144
Carbon Disulfide	19.3	20.0	97	59 - 138
Carbon Tetrachloride	20.7	20.0	104	69 - 135
Chlorobenzene	19.8	20.0	99	80 - 121
Chloroethane	21.6	20.0	108	71 - 130
Chloroform	22.0	20.0	110	78 - 125
Chloromethane	23.2	20.0	116	62 - 133
Cyclohexane	18.5	20.0	92	67 - 127
Dibromochloromethane	19.2	20.0	96	78 - 133
Dichlorodifluoromethane (CFC 12)	19.9	20.0	100	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/23/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243343

Lab Control Sample
 RQ1103557-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.5	20.0	102	75 - 125
Ethylbenzene	20.5	20.0	102	78 - 123
Isopropylbenzene (Cumene)	23.8	20.0	119	73 - 133
Methyl Acetate	22.0	20.0	110	57 - 157
Methyl tert-Butyl Ether	21.6	20.0	108	75 - 126
Methylcyclohexane	18.8	20.0	94	64 - 133
Styrene	20.5	20.0	103	80 - 132
Tetrachloroethene (PCE)	18.8	20.0	94	72 - 131
Toluene	20.0	20.0	100	78 - 122
Trichloroethene (TCE)	19.5	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	23.7	20.0	118	71 - 139
Vinyl Chloride	24.3	20.0	122	71 - 136
cis-1,2-Dichloroethene	22.3	20.0	111	78 - 122
cis-1,3-Dichloropropene	19.7	20.0	98	77 - 125
m,p-Xylenes	40.5	40.0	101	79 - 126
n-Butyl Acetate	17.4	20.0	87	54 - 127
o-Xylene	19.9	20.0	100	79 - 126
trans-1,2-Dichloroethene	21.0	20.0	105	75 - 121
trans-1,3-Dichloropropene	19.6	20.0	98	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/23/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243450

**Lab Control Sample
 RQ1103581-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.4	20.0	97	72 - 128
1,1,2,2-Tetrachloroethane	24.7	20.0	124	72 - 131
1,1,2-Trichloroethane	20.5	20.0	103	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.1	20.0	86	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.0	20.0	100	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.6	20.0	88	72 - 129
1,2,4-Trichlorobenzene	21.5	20.0	107	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.9	20.0	99	62 - 131
1,2-Dibromoethane	20.0	20.0	100	78 - 125
1,2-Dichlorobenzene	21.1	20.0	105	79 - 124
1,2-Dichloroethane	22.0	20.0	110	78 - 126
1,2-Dichloropropane	21.5	20.0	108	80 - 123
1,3-Dichlorobenzene	20.9	20.0	104	78 - 124
1,4-Dichlorobenzene	20.8	20.0	104	78 - 123
n-Butanol	1390	1000	138 *	70 - 130
2-Butanone (MEK)	17.4	20.0	87	60 - 133
2-Hexanone	17.9	20.0	89	61 - 131
4-Methyl-2-pentanone	18.2	20.0	91	61 - 132
Acetone	19.1	20.0	96	59 - 140
Benzene	19.3	20.0	96	78 - 121
Bromodichloromethane	20.6	20.0	103	80 - 125
Bromoform	21.1	20.0	105	73 - 132
Bromomethane	21.4	20.0	107	57 - 144
Carbon Disulfide	20.0	20.0	100	59 - 138
Carbon Tetrachloride	19.7	20.0	98	69 - 135
Chlorobenzene	20.1	20.0	100	80 - 121
Chloroethane	19.2	20.0	96	71 - 130
Chloroform	20.5	20.0	102	78 - 125
Chloromethane	17.6	20.0	88	62 - 133
Cyclohexane	19.0	20.0	95	67 - 127
Dibromochloromethane	21.2	20.0	106	78 - 133
Dichlorodifluoromethane (CFC 12)	22.8	20.0	114	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/23/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243450

**Lab Control Sample
 RQ1103581-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.0	20.0	95	75 - 125
Ethylbenzene	19.7	20.0	98	78 - 123
Isopropylbenzene (Cumene)	19.9	20.0	99	73 - 133
Methyl Acetate	20.2	20.0	101	57 - 157
Methyl tert-Butyl Ether	19.2	20.0	96	75 - 126
Methylcyclohexane	22.3	20.0	111	64 - 133
Styrene	19.4	20.0	97	80 - 132
Tetrachloroethene (PCE)	19.5	20.0	97	72 - 131
Toluene	19.4	20.0	97	78 - 122
Trichloroethene (TCE)	19.3	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	21.7	20.0	109	71 - 139
Vinyl Chloride	21.2	20.0	106	71 - 136
cis-1,2-Dichloroethene	18.6	20.0	93	78 - 122
cis-1,3-Dichloropropene	18.2	20.0	91	77 - 125
m,p-Xylenes	39.5	40.0	99	79 - 126
n-Butyl Acetate	18.2	20.0	91	54 - 127
o-Xylene	19.0	20.0	95	79 - 126
trans-1,2-Dichloroethene	18.6	20.0	93	75 - 121
trans-1,3-Dichloropropene	18.3	20.0	91	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/25/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243441

**Lab Control Sample
 RQ1103576-10**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.5	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	19.0	20.0	95	72 - 131
1,1,2-Trichloroethane	18.9	20.0	94	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.8	20.0	84	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.9	20.0	104	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.3	20.0	87	72 - 129
1,2,4-Trichlorobenzene	18.9	20.0	94	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.1	20.0	85	62 - 131
1,2-Dibromoethane	19.2	20.0	96	78 - 125
1,2-Dichlorobenzene	18.0	20.0	90	79 - 124
1,2-Dichloroethane	22.1	20.0	110	78 - 126
1,2-Dichloropropane	18.4	20.0	92	80 - 123
1,3-Dichlorobenzene	18.1	20.0	91	78 - 124
1,4-Dichlorobenzene	18.0	20.0	90	78 - 123
n-Butanol	1070	1000	107	70 - 130
2-Butanone (MEK)	24.3	20.0	122	60 - 133
2-Hexanone	19.1	20.0	95	61 - 131
4-Methyl-2-pentanone	19.4	20.0	97	61 - 132
Acetone	22.4	20.0	112	59 - 140
Benzene	18.6	20.0	93	78 - 121
Bromodichloromethane	20.1	20.0	101	80 - 125
Bromoform	17.7	20.0	88	73 - 132
Bromomethane	17.7	20.0	88	57 - 144
Carbon Disulfide	20.0	20.0	100	59 - 138
Carbon Tetrachloride	18.5	20.0	93	69 - 135
Chlorobenzene	18.2	20.0	91	80 - 121
Chloroethane	19.2	20.0	96	71 - 130
Chloroform	20.8	20.0	104	78 - 125
Chloromethane	20.7	20.0	103	62 - 133
Cyclohexane	19.2	20.0	96	67 - 127
Dibromochloromethane	18.3	20.0	92	78 - 133
Dichlorodifluoromethane (CFC 12)	17.5	20.0	87	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/25/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243441

**Lab Control Sample
 RQ1103576-10**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.7	20.0	93	75 - 125
Ethylbenzene	18.5	20.0	93	78 - 123
Isopropylbenzene (Cumene)	20.3	20.0	102	73 - 133
Methyl Acetate	21.8	20.0	109	57 - 157
Methyl tert-Butyl Ether	20.2	20.0	101	75 - 126
Methylcyclohexane	19.2	20.0	96	64 - 133
Styrene	18.5	20.0	93	80 - 132
Tetrachloroethene (PCE)	16.5	20.0	83	72 - 131
Toluene	18.2	20.0	91	78 - 122
Trichloroethene (TCE)	18.4	20.0	92	74 - 127
Trichlorofluoromethane (CFC 11)	20.5	20.0	102	71 - 139
Vinyl Chloride	20.9	20.0	104	71 - 136
cis-1,2-Dichloroethene	20.7	20.0	104	78 - 122
cis-1,3-Dichloropropene	18.3	20.0	92	77 - 125
m,p-Xylenes	36.6	40.0	91	79 - 126
n-Butyl Acetate	17.8	20.0	89	54 - 127
o-Xylene	17.9	20.0	89	79 - 126
trans-1,2-Dichloroethene	18.8	20.0	94	75 - 121
trans-1,3-Dichloropropene	18.5	20.0	92	69 - 127

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/25/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243554

**Lab Control Sample
 RQ1103801-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.1	20.0	90	72 - 128
1,1,2,2-Tetrachloroethane	25.5	20.0	128	72 - 131
1,1,2-Trichloroethane	19.5	20.0	97	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.7	20.0	78	71 - 134
1,1-Dichloroethane (1,1-DCA)	18.7	20.0	93	76 - 122
1,1-Dichloroethene (1,1-DCE)	15.9	20.0	79	72 - 129
1,2,4-Trichlorobenzene	20.8	20.0	104	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	20.6	20.0	103	62 - 131
1,2-Dibromoethane	19.9	20.0	99	78 - 125
1,2-Dichlorobenzene	19.8	20.0	99	79 - 124
1,2-Dichloroethane	21.1	20.0	105	78 - 126
1,2-Dichloropropane	19.6	20.0	98	80 - 123
1,3-Dichlorobenzene	19.2	20.0	96	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
n-Butanol	1270	1000	127	70 - 130
2-Butanone (MEK)	17.1	20.0	86	60 - 133
2-Hexanone	17.2	20.0	86	61 - 131
4-Methyl-2-pentanone	17.3	20.0	87	61 - 132
Acetone	18.1	20.0	90	59 - 140
Benzene	17.6	20.0	88	78 - 121
Bromodichloromethane	20.3	20.0	102	80 - 125
Bromoform	21.2	20.0	106	73 - 132
Bromomethane	20.1	20.0	100	57 - 144
Carbon Disulfide	20.5	20.0	102	59 - 138
Carbon Tetrachloride	18.3	20.0	92	69 - 135
Chlorobenzene	18.6	20.0	93	80 - 121
Chloroethane	16.7	20.0	84	71 - 130
Chloroform	19.5	20.0	98	78 - 125
Chloromethane	16.1	20.0	80	62 - 133
Cyclohexane	17.3	20.0	86	67 - 127
Dibromochloromethane	21.9	20.0	109	78 - 133
Dichlorodifluoromethane (CFC 12)	21.0	20.0	105	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/25/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243554

Lab Control Sample
 RQ1103801-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.2	20.0	91	75 - 125
Ethylbenzene	17.2	20.0	86	78 - 123
Isopropylbenzene (Cumene)	16.4	20.0	82	73 - 133
Methyl Acetate	19.6	20.0	98	57 - 157
Methyl tert-Butyl Ether	18.8	20.0	94	75 - 126
Methylcyclohexane	20.6	20.0	103	64 - 133
Styrene	17.2	20.0	86	80 - 132
Tetrachloroethene (PCE)	17.1	20.0	85	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	17.4	20.0	87	74 - 127
Trichlorofluoromethane (CFC 11)	19.9	20.0	100	71 - 139
Vinyl Chloride	18.7	20.0	94	71 - 136
cis-1,2-Dichloroethene	17.1	20.0	86	78 - 122
cis-1,3-Dichloropropene	17.2	20.0	86	77 - 125
m,p-Xylenes	34.3	40.0	86	79 - 126
n-Butyl Acetate	16.9	20.0	84	54 - 127
o-Xylene	16.4	20.0	82	79 - 126
trans-1,2-Dichloroethene	16.4	20.0	82	75 - 121
trans-1,3-Dichloropropene	17.9	20.0	89	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/26/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 243491

Lab Control Sample
 RQ1103593-10

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.9	20.0	110	72 - 128
1,1,2,2-Tetrachloroethane	20.5	20.0	103	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.1	20.0	95	71 - 134
1,1-Dichloroethane (1,1-DCA)	23.9	20.0	120	76 - 122
1,1-Dichloroethene (1,1-DCE)	20.0	20.0	100	72 - 129
1,2,4-Trichlorobenzene	19.8	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	20.2	20.0	101	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	24.4	20.0	122	78 - 126
1,2-Dichloropropane	19.8	20.0	99	80 - 123
1,3-Dichlorobenzene	19.0	20.0	95	78 - 124
1,4-Dichlorobenzene	19.2	20.0	96	78 - 123
n-Butanol	1060	1000	106	70 - 130
2-Butanone (MEK)	25.5	20.0	128	60 - 133
2-Hexanone	21.8	20.0	109	61 - 131
4-Methyl-2-pentanone	20.4	20.0	102	61 - 132
Acetone	21.2	20.0	106	59 - 140
Benzene	19.8	20.0	99	78 - 121
Bromodichloromethane	22.1	20.0	111	80 - 125
Bromoform	18.4	20.0	92	73 - 132
Bromomethane	18.7	20.0	93	57 - 144
Carbon Disulfide	23.0	20.0	115	59 - 138
Carbon Tetrachloride	20.7	20.0	104	69 - 135
Chlorobenzene	19.5	20.0	97	80 - 121
Chloroethane	21.9	20.0	109	71 - 130
Chloroform	23.0	20.0	115	78 - 125
Chloromethane	24.2	20.0	121	62 - 133
Cyclohexane	19.5	20.0	98	67 - 127
Dibromochloromethane	18.5	20.0	93	78 - 133
Dichlorodifluoromethane (CFC 12)	19.8	20.0	99	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/26/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 243491

**Lab Control Sample
 RQ1103593-10**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.1	20.0	106	75 - 125
Ethylbenzene	19.9	20.0	100	78 - 123
Isopropylbenzene (Cumene)	22.6	20.0	113	73 - 133
Methyl Acetate	23.2	20.0	116	57 - 157
Methyl tert-Butyl Ether	22.3	20.0	112	75 - 126
Methylcyclohexane	19.8	20.0	99	64 - 133
Styrene	20.1	20.0	101	80 - 132
Tetrachloroethene (PCE)	18.2	20.0	91	72 - 131
Toluene	19.4	20.0	97	78 - 122
Trichloroethene (TCE)	20.9	20.0	104	74 - 127
Trichlorofluoromethane (CFC 11)	23.6	20.0	118	71 - 139
Vinyl Chloride	24.2	20.0	121	71 - 136
cis-1,2-Dichloroethene	22.5	20.0	112	78 - 122
cis-1,3-Dichloropropene	19.6	20.0	98	77 - 125
m,p-Xylenes	39.4	40.0	98	79 - 126
n-Butyl Acetate	18.6	20.0	93	54 - 127
o-Xylene	19.3	20.0	96	79 - 126
trans-1,2-Dichloroethene	20.6	20.0	103	75 - 121
trans-1,3-Dichloropropene	19.6	20.0	98	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/26/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243708

Lab Control Sample
 RQ1103699-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	22.2	20.0	111	72 - 128
1,1,2,2-Tetrachloroethane	22.8	20.0	114	72 - 131
1,1,2-Trichloroethane	20.8	20.0	104	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.0	100	71 - 134
1,1-Dichloroethane (1,1-DCA)	21.0	20.0	105	76 - 122
1,1-Dichloroethene (1,1-DCE)	21.1	20.0	106	72 - 129
1,2,4-Trichlorobenzene	24.8	20.0	124	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	22.6	20.0	113	62 - 131
1,2-Dibromoethane	21.9	20.0	109	78 - 125
1,2-Dichlorobenzene	23.8	20.0	119	79 - 124
1,2-Dichloroethane	22.3	20.0	112	78 - 126
1,2-Dichloropropane	21.8	20.0	109	80 - 123
1,3-Dichlorobenzene	23.9	20.0	119	78 - 124
1,4-Dichlorobenzene	23.9	20.0	120	78 - 123
n-Butanol	1080	1000	108	70 - 130
2-Butanone (MEK)	19.1	20.0	96	60 - 133
2-Hexanone	20.5	20.0	103	61 - 131
4-Methyl-2-pentanone	19.8	20.0	99	61 - 132
Acetone	17.1	20.0	85	59 - 140
Benzene	21.8	20.0	109	78 - 121
Bromodichloromethane	22.8	20.0	114	80 - 125
Bromoform	25.3	20.0	126	73 - 132
Bromomethane	14.2	20.0	71	57 - 144
Carbon Disulfide	22.5	20.0	112	59 - 138
Carbon Tetrachloride	22.3	20.0	112	69 - 135
Chlorobenzene	23.1	20.0	116	80 - 121
Chloroethane	21.4	20.0	107	71 - 130
Chloroform	22.2	20.0	111	78 - 125
Chloromethane	19.3	20.0	97	62 - 133
Cyclohexane	19.1	20.0	95	67 - 127
Dibromochloromethane	24.2	20.0	121	78 - 133
Dichlorodifluoromethane (CFC 12)	16.7	20.0	84	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/26/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243708

Lab Control Sample
 RQ1103699-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.6	20.0	98	75 - 125
Ethylbenzene	23.4	20.0	117	78 - 123
Isopropylbenzene (Cumene)	26.6	20.0	133	73 - 133
Methyl Acetate	19.5	20.0	98	57 - 157
Methyl tert-Butyl Ether	20.7	20.0	103	75 - 126
Methylcyclohexane	20.0	20.0	100	64 - 133
Styrene	24.1	20.0	120	80 - 132
Tetrachloroethene (PCE)	22.9	20.0	114	72 - 131
Toluene	22.8	20.0	114	78 - 122
Trichloroethene (TCE)	22.1	20.0	111	74 - 127
Trichlorofluoromethane (CFC 11)	22.5	20.0	113	71 - 139
Vinyl Chloride	21.5	20.0	107	71 - 136
cis-1,2-Dichloroethene	22.4	20.0	112	78 - 122
cis-1,3-Dichloropropene	21.2	20.0	106	77 - 125
m,p-Xylenes	47.2	40.0	118	79 - 126
n-Butyl Acetate	22.4	20.0	112	54 - 127
o-Xylene	23.1	20.0	115	79 - 126
trans-1,2-Dichloroethene	21.0	20.0	105	75 - 121
trans-1,3-Dichloropropene	21.1	20.0	106	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1102105
 Date Analyzed: 4/27/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 243847

Lab Control Sample
 RQ1103723-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.6	20.0	108	72 - 128
1,1,2,2-Tetrachloroethane	20.6	20.0	103	72 - 131
1,1,2-Trichloroethane	20.6	20.0	103	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.1	20.0	90	71 - 134
1,1-Dichloroethane (1,1-DCA)	23.9	20.0	119	76 - 122
1,1-Dichloroethene (1,1-DCE)	19.4	20.0	97	72 - 129
1,2,4-Trichlorobenzene	20.3	20.0	101	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.4	20.0	82	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	24.7	20.0	123	78 - 126
1,2-Dichloropropane	19.8	20.0	99	80 - 123
1,3-Dichlorobenzene	18.7	20.0	94	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	1070	1000	107	70 - 130
2-Butanone (MEK)	25.6	20.0	128	60 - 133
2-Hexanone	21.2	20.0	106	61 - 131
4-Methyl-2-pentanone	18.7	20.0	94	61 - 132
Acetone	24.0	20.0	120	59 - 140
Benzene	19.6	20.0	98	78 - 121
Bromodichloromethane	21.3	20.0	106	80 - 125
Bromoform	18.7	20.0	94	73 - 132
Bromomethane	19.0	20.0	95	57 - 144
Carbon Disulfide	20.9	20.0	104	59 - 138
Carbon Tetrachloride	20.9	20.0	104	69 - 135
Chlorobenzene	19.3	20.0	96	80 - 121
Chloroethane	22.2	20.0	111	71 - 130
Chloroform	22.4	20.0	112	78 - 125
Chloromethane	22.9	20.0	115	62 - 133
Cyclohexane	19.6	20.0	98	67 - 127
Dibromochloromethane	18.9	20.0	95	78 - 133
Dichlorodifluoromethane (CFC 12)	19.7	20.0	98	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/27/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 243847

**Lab Control Sample
 RQ1103723-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.0	20.0	100	75 - 125
Ethylbenzene	19.8	20.0	99	78 - 123
Isopropylbenzene (Cumene)	22.3	20.0	112	73 - 133
Methyl Acetate	22.1	20.0	110	57 - 157
Methyl tert-Butyl Ether	21.7	20.0	109	75 - 126
Methylcyclohexane	20.1	20.0	100	64 - 133
Styrene	19.9	20.0	99	80 - 132
Tetrachloroethene (PCE)	18.3	20.0	91	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	20.3	20.0	102	74 - 127
Trichlorofluoromethane (CFC 11)	23.3	20.0	116	71 - 139
Vinyl Chloride	24.0	20.0	120	71 - 136
cis-1,2-Dichloroethene	21.5	20.0	107	78 - 122
cis-1,3-Dichloropropene	19.9	20.0	99	77 - 125
m,p-Xylenes	39.5	40.0	99	79 - 126
n-Butyl Acetate	17.2	20.0	86	54 - 127
o-Xylene	19.3	20.0	96	79 - 126
trans-1,2-Dichloroethene	20.4	20.0	102	75 - 121
trans-1,3-Dichloropropene	19.4	20.0	97	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/22/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 243146

Lab Control Sample
RQ1103472-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	26.3	26.1	101	55 - 165
Ethene	23.7	24.3	97	48 - 163
Methane	25.8	26.2	98	61 - 154

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/26/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 243684

Analyte Name	Lab Control Sample RQ1103670-02			Duplicate Lab Control Sample RQ1103670-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.4	26.1	101	25.0	26.1	96	55 - 165	5	30
Ethene	23.8	24.3	98	22.6	24.3	93	48 - 163	5	30
Methane	26.7	26.2	102	25.3	26.2	97	61 - 154	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/27/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 243805

Lab Control Sample
RQ1103704-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	27.3	26.1	105	55 - 165
Ethene	24.7	24.3	102	48 - 163
Methane	27.7	26.2	105	61 - 154

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 4/28/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 243960

Lab Control Sample
RQ1103813-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	26.5	26.1	102	55 - 165
Ethene	24.7	24.3	102	48 - 163
Methane	26.8	26.2	102	61 - 154

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 5/ 5/11

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 243151

Analyte Name	Lab Control Sample RQ1103475-02			Duplicate Lab Control Sample RQ1103475-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.10	0.998	110	1.09	0.998	109	70 - 130	<1	30
Acetic Acid	9.83	9.97	99	9.80	9.97	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.98	9.98	100	10.0	9.98	100	82 - 118	<1	30
Lactic Acid	9.73	10.0	97	9.71	10.0	97	70 - 117	<1	30
Propionic Acid	10.2	9.97	102	10.2	9.97	103	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1102105
Date Analyzed: 5/ 8/11

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 245199

Analyte Name	Lab Control Sample RQ1104219-02			Duplicate Lab Control Sample RQ1104219-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.19	0.998	119	1.05	0.998	105	70 - 130	13	30
Acetic Acid	9.95	9.97	100	9.78	9.97	98	70 - 135	2	30
Butanoic Acid (Butyric Acid)	10.5	9.98	106	10.2	9.98	102	82 - 118	3	30
Lactic Acid	9.82	10.0	98	9.63	10.0	96	70 - 117	2	30
Propionic Acid	10.1	9.97	102	10.2	9.97	102	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEES (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0007-038-5-20110418	4/18/2011	1510	001.002	GW	0										
LC34-IW0002I-027.5-20110418	4/18/2011	1457	003.004	GW	16	3	2	1	3	1	3	1	1	1	
LC34-IW0002D-037.5-20110418	4/18/2011	1020	005.006	GW	16	3	2	1	3	1	3	1	1	1	
LC34-BW0001A-024.5-20110418	4/18/2011	1040	007.008	GW	16	3	2	1	3	1	3	1	1	1	
LC34-BW0001B-031.5-20110418	4/18/2011	1120	009.009-010	GW	16	3	2	1	3	1	3	1	1	1	
LC34-BW0001C-038.5-20110418	4/18/2011	1400	011.012	GW	16	3	2	1	3	1	3	1	1	1	
LC34-BW0001D-045.5-20110418	4/18/2011			GW	0										
LC34-BW0002A-024.5-20110418				GW	0										
LC34-BW0002B-031.5-20110418				GW	0										
LC34-BW0002C-038.5-20110418				GW	0										

Comments/Special Instructions: 3 weeks

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

RECEIVED BY: [Signature]
 Signature: [Signature]
 Printed Name: [Name]
 Firm: [Firm]
 Date/Time: [Date/Time]

RECEIVED BY: [Signature]
 Signature: [Signature]
 Printed Name: [Name]
 Firm: [Firm]
 Date/Time: [Date/Time]



Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Titusville, FL 32780 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Number of Containers
 VOCs (8260C) plus n-butyl acetate
 VFAs (300)
 Bromide and Iodide (300.0)
 TOC (9060A)
 Sulfide (9060A)
 MEES (RSK 175)
 Anions (300.0)
 Alkalinity (310.1)
 Dissolved Metals (6010B)

Sample I.D.	Date	Time	LAB ID	Matrix	REMARKS
#034-BW0002D-045.5-201104				GW	
#034-BW0005A-024.3-201104				GW	
#034-BW0005B-031.5-201104				GW	
#034-BW0005C-038.5-201104				GW	
LC34-BW0003D-045.5-201104				GW	
LC34-KW0008-052.0-201104				GW	
LC34-IW0002D1-050.0-20110418	4/18/2011	1535	013.014	GW	16 3 2 1 3 1 3 1 1 1
LC34-BW0001E-052.5-20110418	4/18/2011	1220	015.016	GW	16 3 2 1 3 1 3 1 1 1
LC34-BW0001F-059.5-20110418	4/18/2011	1150	017.018	GW	16 3 2 1 3 1 3 1 1 1
#034-BW0002E-052.5-201104				GW	0

Comments/Special Instructions:
 3 coolers

R1102105
 GeoSyntec Consulting
 ESTCP PED LC34 TR0272



TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:
 Invoice Information
 P.O. #
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joe Bartlett
 Firm: Geosyntec
 Date/Time: 4/18/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory LaFon
 Firm: CAS
 Date/Time: 4/19/11 0941

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0002F-059.5-201104				GW	0										
LC34-BW0003E-052.5-201104				GW	0										
LC34-BW0003F-059.5-201104				GW	0										
LC34-IW0076-075.0-20110418	4/18/2011	1435	-019, 020	GW	13	3	2	1	3		3				1
LC34-IW0067D-040.5-20110418	4/18/2011	1132	-021	GW	6	3			3						
LC34-IW0067D1-068.0-20110418	4/18/2011	1219	-022	GW	6	3			3						
LC34-IW0070D-040.5-20110418	4/18/2011	1021	-023	GW	6	3			3						
LC34-IW0070D1-070.0-20110418	4/18/2011	1056	-024	GW	6	3			3						
LC34-IW0071D-040.5-20110418	4/18/2011	1356	-025	GW	6	3			3						
LC34-IW0071D1-070.0-20110418	4/18/2011	1423	-026	GW	6	3			3						

Comments/Special Instructions: 3 Coolers

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?; NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joe Bartlett
 Firm: Geosyntec
 Date/Time: 4/18/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joe Bartlett
 Firm: Geosyntec
 Date/Time: 4/18/11 - 1700

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Letour
 Firm: CAS
 Date/Time: 4/19/11 0941

R1102105

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTIC PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: 


Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-EF0005-000.0-20110418	4/18/2011	1525	027	GW	3	3									
LC34-EF0006-000.0-20110418	4/18/2011	1525	028	GW	3	3									
LC34-TB-20110418-01	4/18/2011	NA	029	GW	3	3									
				GW	0										
				GW	0										
				GW	0										
				GW	0										
				GW	0										
				GW	0										
				GW	0										

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD


Comments/Special Instructions:
3 copies

R1102015

RELINQUISHED BY: 
 Signature: _____
 Printed Name: Joe Bartlett
 Firm: Geosyntec
 Date/Time: 4/18/11 - 1700

RECEIVED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY: _____
 Signature: 
 Printed Name: Gregory LaFro
 Firm: CAI
 Date/Time: 4/19/11 0941

Cooler Receipt And Preservation Check Form

Project/Client Academy Folder Number R1102105

Cooler received on 4/19/11 by: AP COURIER: CAS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc.)? YES NO
- Did all bottles arrive in good condition (unbroken)? YES NO
- Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
- Were Ice or Ice packs present? YES NO *not enough ice*
- Where did the bottles originate? CAS/RCC, CLIENT
- Temperature of cooler(s) upon receipt: 70 10 20

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 4/19/11 0945

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples:

PC Secondary Review: KB 4/19/11

Cooler Breakdown: Date: 4/19/11 Time: 1400 by: AP

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO*
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies:

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH			WC103057F	2/16				
≤2	HNO ₃								
≤2	H ₂ SO ₄			WC103001A	2/12				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis -- pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	BDB26109E	3/12				
	HCl	*	*	4110020	3/12				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust:

Bottle lot numbers: 0-319-004, 0-235-003, 031411-216, 122710-222

Other Comments:
VOA - Headspace BW0001E
LC34-EF0006-0030 } 1 vial ea.
IW0071D1
Sulfide - Headspace BW0001E
BW0001B } all
BW0001C
IW0002I

* 8260 VOA label for 10L. - 811 labeled BW0001. It's 10L. was determined based on sample date + time + process of elimination

H₃PO₄: WC92115F exp 11/14

PC Secondary Review: KB 5/17/11 *significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Analysis Requested

Sample I.D.	Date	Time	LAB ID	Matrix	VOCs (8260) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-20110419	4/19/2011	917	-030, 031	GW	16	3	1	3	1	3	1	1	1	
LC34-RW0007-038.5-20110419-D	4/19/2011	917	-032, 033, 034	GW	15	3	2	3	1	3	1	1	1	
LC34-RW0008-038.5-20110419	4/19/2011	1027	-034, 035	GW	16	3	2	3	1	3	1	1	1	
LC34-RW0008-038.5-20110419-D	4/19/2011	1027	-036, 037, 038	GW	3	3								
LC34-BW0002A-024.5-20110419	4/19/2011	915	-037	GW	12	3	2	1	3	3				
LC34-BW0002B-031.5-20110419	4/19/2011	1020	-038	GW	12	3	2	1	3	3				
LC34-BW0002C-038.5-20110419	4/19/2011	1105	-039	GW	12	3	2	1	3	3	X			add back as per email
LC34-BW0002D-045.5-20110419	4/19/2011	1305	-040	GW	12	3	2	1	3	3				
LC34-BW0002E-052.5-20110419	4/19/2011	1350	-041	GW	12	3	2	1	3	3				
LC34-BW0002F-059.5-20110419	4/19/2011	1445	-042	GW	12	3	2	1	3	3				

Number of Containers: _____
 Comments/Special Instructions: x 3 coolers

R1102105
 GeoSyntec Consultants
 ESTCP PED LC34 TR0272



TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Christine M Katan
 Firm: CAS
 Date/Time: 4/20/11 1035

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: J. Bacth
 Firm: Geosyntec
 Date/Time: 4/19/11 1710

RECEIVED BY:
 Signature: [Signature]
 Printed Name: FEDEx
 Firm: _____
 Date/Time: _____

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	VOCs (8260) plus n-butyl acetate	VFA's (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MES (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0003A-024.5-20110419	4/19/2011	1136	-043	GW	12	2	1	3		3				
LC34-BW0003B-031.5-20110419	4/19/2011	1323	-044	GW	12	2	1	3		3				
LC34-BW0003B-Q-031.5-20110419	4/19/2011	1323	-045 RE 4/11/11	GW	3	3								
LC34-BW0003C-038.5-20110419	4/19/2011	1443	-046	GW	12	3	1	3	X	3	X			added to general
LC34-BW0003D-045.5-20110419	4/19/2011	1245	-047	GW	12	3	1	3		3				
LC34-BW0003D-D-045.5-20110419	4/19/2011	1245	-048	GW	3	3								
LC34-BW0003E-052.5-20110419	4/19/2011	1406	-049	GW	12	3	1	3		3				
LC34-BW0003F-059.5-20110419	4/19/2011	1519	-050	GW	12	3	1	3		3				
				GW	0									
				GW	0									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Comments/Special Instructions:

R1102105
 Geosyntec Consultants
 ESTCP PED LC34 TR0272



RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: J. Bartlett
 Firm: Geosyntec
 Date/Time: 4/19/11 - 1710

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Christine M Kuster
 Firm: CAS
 Date/Time: 4/20/11 1035

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-20110419-01	4/19/2011	NA	-051	GW	3	3									
LC34-FD-20110419-02	4/19/2011	NA	-052	GW	2		2								
LC34-FD-20110419-03	4/19/2011	NA	-053	GW	3						3				
LC34-FD-20110419-04	4/19/2011	NA	-054	GW	3										
LC34-FD-20110419-05	4/19/2011	NA	-055	GW	1					1					
LC34-FD-20110419-06	4/19/2011	NA	-056	GW	1										
LC34-FD-20110419-07	4/19/2011	NA	-057	GW	1							1			
LC34-FD-20110419-08	4/19/2011	NA	-058	GW	1									1	
LC34-FD-20110419-09	4/19/2011	NA	-059	GW	2		2								
LC34-FD-20110419-10	4/19/2011	NA	-060	GW	3	3									

Comments/Special Instructions: X3 coolers

R1102105
 Geosyntec Consultants
 ESTCP PED LC34 TR0272

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY: Signature: [Signature] Printed Name: J. Bartlett Firm: Geosyntec Date/Time: 4/19/11 - 1710

RECEIVED BY: Signature: [Signature] Printed Name: J. Bartlett Firm: Geosyntec Date/Time: 4/19/11 - 1710

RELINQUISHED BY: Signature: [Signature] Printed Name: J. Bartlett Firm: Geosyntec Date/Time: 4/19/11 - 1710

RECEIVED BY: Signature: [Signature] Printed Name: J. Bartlett Firm: Geosyntec Date/Time: 4/19/11 - 1710

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (826C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-20110419-11	4/19/2011	NA	extel	GW	3						3				
LC34-FD-20110419-12	4/19/2011	NA	extel	GW	3				3						
LC34-FD-20110419-13	4/19/2011	NA	extel	GW	3	3									
LC34-TB-20110419-01	4/19/2011	NA	extel	GW	3	3									
LC34-TB-20110419-02	4/19/2011	NA	extel	GW	3	3									
				GW	0										
				GW	0										
				GW	0										
				GW	0										
				GW	0										
				GW	0										

Comments/Special Instructions: X3 coolers

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

TURNAROUND REQUIREMENTS
 RECEIVED BY: [Signature]
 Signature: [Signature]
 Printed Name: D. Bartlett
 Firm: Geosyntec
 Date/Time: 4/19/11 17:10

REPORT REQUIREMENTS
 RECEIVED BY: [Signature]
 Signature: [Signature]
 Printed Name: Christina M. Kutz
 Firm: CH2S
 Date/Time: 4/20/11 10:35

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R1102105

Cooler received on 4/20/11 by: cmk COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 2.8 3.0 3.6

*post its w/ missing
add chemical
samples
see below*

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 4/20/11 1105

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank X Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: RB 4/20/11

Cooler Breakdown: Date: 4/20/11 Time: 1400-1500 by: BJ

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO *see notes*
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			WC103651F	2/16				
≤2	H ₃ PO ₄			WC92115F	11/14				
≤2	H ₂ SO ₄			WC103001A	2/12				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	BDB26109E	3/12				
	HCl	*	*	4110020	3/12				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 0-235-003, 0-319-004, 031411-2K, 122710-222

Other Comments: metabolic acids 2 vials each * 1 vial only 0.6 → 1.5
8200 air bubbles - BW002B BW002D, FD-20110419-10
RSK175 BW002F BW002F, BW002E, BW002A, FD20110419-01
BW002A
BW002C, FD-20110419-03 * See Extra Temp Sheet *

PC Secondary Review: RB 5/11/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Cooler Receipt And Preservation Check Form

Project/Client _____ Folder Number R1102105 continued

Cooler received on _____ by: _____ **COURIER:** CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
 3. Did all bottles arrive in good condition (unbroken)? YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 5. Were Ice or Ice packs present? YES NO
 6. Where did the bottles originate? CAS/ROC, CLIENT
 7. Temperature of cooler(s) upon receipt: _____
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: _____

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: _____

Cooler Breakdown: Date: _____ Time: _____ by: _____

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH									No = Samples were preserved at lab as listed
≤2	HNO ₃									
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						PM OK to Adjust: _____
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet				
	Zn Aceta	-	-							
	HCl	*	*							

Bottle lot numbers: _____

Other Comments: _____

* Rec. bottle for Br, I (with no FD on it); ~~missing BWO007 & Br, I bottle.~~
 + * " Full test list for BWO02C, w/o diss. metals; chain only says VOA, VFA, RSK, BR, F, TOC
 BWO03C
 * Missing Br, I bottle for ~~BWO07~~ and BWO02F
 *X assumed unlabelled Br, I is BWO02F only unlabelled missing bottle.

PC Secondary Review: SL/lu KB

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

July 25, 2011

Service Request No: R1103564

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 PED/TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on June 24, 2011. For your reference, these analyses have been assigned our service request number **R1103564**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 40

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1103564
Date Received: 6/24/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Eight (8) water samples were collected by the client on 6/21-22/11 and were received for analysis at Columbia Analytical Services on 6/24/11 via a national courier. The "Test Blank" was placed on hold as per instructions in an email from the client on 6/24/11. Only VOC vials were received for this sample, though the chain of custody indicated Bromide and Iodide also. For location BATCH29-20110622-0745 (R1103564-004), the bottle for Bromide and Iodide was labeled as BATCH26-20110622-0745. The samples were received at a cooler temperature of 3.8°C within the guidelines of 0-6°C.

Volatile Organic Compounds

Seven (7) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination except for a 1,2,4-Trichlorobenzene hit in the 6/27/11 blank and 1,2,4-Trichlorobenzene and Chloroform hits in the 6/28/11 blank. The 1,2,4-Trichlorobenzene hit for BATCH39-20110622-1150 has been flagged as "B" to indicate possible contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Seven (7) water samples were analyzed for Bromide and four (4) samples were analyzed for Iodide by IC method 300.0.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

Approved by Raeen Bende Date 7/26/11

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by Karen Burlew Date 7/26/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1103564

<u>Lab ID</u>	<u>Client ID</u>
R1103564-001	BATCH10-20110621-0825
R1103564-002	BATCH17-20110621-1127
R1103564-003	BATCH26-20110621-1725
R1103564-004	BATCH29-20110622-0745
R1103564-005	BATCH39-20110622-1150
R1103564-006	BATCH40-20110622-1458
R1103564-007	BATCH49-20110622-1655

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the “Notes” column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an “immediate” hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory’s NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH10-20110621-0825
Lab Code: R1103564-001

Service Request: R1103564
Date Collected: 6/21/11 0825
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	65.3	mg/L	2.0	20	NA	6/27/11 16:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: BATCH10-20110621-0825
 Lab Code: R1103564-001

Service Request: R1103564
 Date Collected: 6/21/11 0825
 Date Received: 6/24/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	6/27/11 16:54		251477	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	6/27/11 16:54		251477	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	6/27/11 16:54		251477	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	6/27/11 16:54		251477	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	6/27/11 16:54		251477	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	6/27/11 16:54		251477	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	6/27/11 16:54		251477	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
n-Butanol	1000000	U	1000000	210000	20000	NA	6/27/11 16:54		251477	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	6/27/11 16:54		251477	
2-Hexanone	200000	U	200000	7000	20000	NA	6/27/11 16:54		251477	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	6/27/11 16:54		251477	
Acetone	400000	U	400000	20000	20000	NA	6/27/11 16:54		251477	
Benzene	100000	U	100000	4200	20000	NA	6/27/11 16:54		251477	
Bromodichloromethane	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Bromoform	100000	U	100000	5400	20000	NA	6/27/11 16:54		251477	
Bromomethane	100000	U	100000	6200	20000	NA	6/27/11 16:54		251477	
Carbon Disulfide	200000	U	200000	4000	20000	NA	6/27/11 16:54		251477	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	6/27/11 16:54		251477	
Chlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Chloroethane	100000	U	100000	6200	20000	NA	6/27/11 16:54		251477	
Chloroform	100000	U	100000	4400	20000	NA	6/27/11 16:54		251477	
Chloromethane	100000	U	100000	4800	20000	NA	6/27/11 16:54		251477	
Cyclohexane	200000	U	200000	4800	20000	NA	6/27/11 16:54		251477	
Dibromochloromethane	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	6/27/11 16:54		251477	
Dichloromethane	100000	U	100000	4400	20000	NA	6/27/11 16:54		251477	
Ethylbenzene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Methyl Acetate	200000	U	200000	4600	20000	NA	6/27/11 16:54		251477	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH10-20110621-0825
Lab Code: R1103564-001

Service Request: R1103564
Date Collected: 6/21/11 0825
Date Received: 6/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Methylcyclohexane	200000	U	200000	5000	20000	NA	6/27/11 16:54		251477	
Styrene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Toluene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	6/27/11 16:54		251477	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
Vinyl Chloride	100000	U	100000	4600	20000	NA	6/27/11 16:54		251477	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
m,p-Xylenes	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
n-Butyl Acetate	2500000		100000	4200	20000	NA	6/27/11 16:54		251477	
o-Xylene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 16:54		251477	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	6/27/11 16:54	
Dibromofluoromethane	107	89-119	6/27/11 16:54	
Toluene-d8	108	87-121	6/27/11 16:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH17-20110621-1127
Lab Code: R1103564-002

Service Request: R1103564
Date Collected: 6/21/11 1127
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	111	mg/L	3.0	30	NA	6/27/11 16:57	
Iodide	300.0	70	mg/L	20	100	NA	7/12/11 14:24	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: BATCH17-20110621-1127
 Lab Code: R1103564-002

Service Request: R1103564
 Date Collected: 6/21/11 1127
 Date Received: 6/24/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	6/28/11 12:53		251657	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	6/28/11 12:53		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	6/28/11 12:53		251657	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	6/28/11 12:53		251657	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	6/28/11 12:53		251657	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	6/28/11 12:53		251657	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	6/28/11 12:53		251657	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
n-Butanol	500000	U	500000	110000	10000	NA	6/28/11 12:53		251657	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	6/28/11 12:53		251657	
2-Hexanone	100000	U	100000	3500	10000	NA	6/28/11 12:53		251657	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	6/28/11 12:53		251657	
Acetone	200000	U	200000	9800	10000	NA	6/28/11 12:53		251657	
Benzene	50000	U	50000	2100	10000	NA	6/28/11 12:53		251657	
Bromodichloromethane	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Bromoform	50000	U	50000	2700	10000	NA	6/28/11 12:53		251657	
Bromomethane	50000	U	50000	3100	10000	NA	6/28/11 12:53		251657	
Carbon Disulfide	100000	U	100000	2000	10000	NA	6/28/11 12:53		251657	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	6/28/11 12:53		251657	
Chlorobenzene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Chloroethane	50000	U	50000	3100	10000	NA	6/28/11 12:53		251657	
Chloroform	50000	U	50000	2200	10000	NA	6/28/11 12:53		251657	
Chloromethane	50000	U	50000	2400	10000	NA	6/28/11 12:53		251657	
Cyclohexane	100000	U	100000	2400	10000	NA	6/28/11 12:53		251657	
Dibromochloromethane	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	6/28/11 12:53		251657	
Dichloromethane	50000	U	50000	2200	10000	NA	6/28/11 12:53		251657	
Ethylbenzene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Methyl Acetate	100000	U	100000	2300	10000	NA	6/28/11 12:53		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH17-20110621-1127
Lab Code: R1103564-002

Service Request: R1103564
Date Collected: 6/21/11 1127
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Methylcyclohexane	100000	U	100000	2500	10000	NA	6/28/11 12:53		251657	
Styrene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Toluene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	6/28/11 12:53		251657	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
Vinyl Chloride	50000	U	50000	2300	10000	NA	6/28/11 12:53		251657	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
m,p-Xylenes	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
n-Butyl Acetate	1900000	D	100000	4200	20000	NA	6/28/11 13:23		251657	
o-Xylene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	6/28/11 12:53		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	6/28/11 12:53	
Dibromofluoromethane	107	89-119	6/28/11 12:53	
Toluene-d8	107	87-121	6/28/11 12:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH26-20110621-1725
Lab Code: R1103564-003

Service Request: R1103564
Date Collected: 6/21/11 1725
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	109	mg/L	3.0	30	NA	6/27/11 17:12	
Iodide	300.0	150	mg/L	20	100	NA	7/12/11 14:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: BATCH26-20110621-1725
 Lab Code: R1103564-003

Service Request: R1103564
 Date Collected: 6/21/11 1725
 Date Received: 6/24/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	6/27/11 17:54		251477	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	6/27/11 17:54		251477	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	6/27/11 17:54		251477	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	6/27/11 17:54		251477	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	6/27/11 17:54		251477	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	6/27/11 17:54		251477	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	6/27/11 17:54		251477	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
n-Butanol	1000000	U	1000000	210000	20000	NA	6/27/11 17:54		251477	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	6/27/11 17:54		251477	
2-Hexanone	200000	U	200000	7000	20000	NA	6/27/11 17:54		251477	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	6/27/11 17:54		251477	
Acetone	400000	U	400000	20000	20000	NA	6/27/11 17:54		251477	
Benzene	100000	U	100000	4200	20000	NA	6/27/11 17:54		251477	
Bromodichloromethane	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Bromoform	100000	U	100000	5400	20000	NA	6/27/11 17:54		251477	
Bromomethane	100000	U	100000	6200	20000	NA	6/27/11 17:54		251477	
Carbon Disulfide	200000	U	200000	4000	20000	NA	6/27/11 17:54		251477	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	6/27/11 17:54		251477	
Chlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Chloroethane	100000	U	100000	6200	20000	NA	6/27/11 17:54		251477	
Chloroform	100000	U	100000	4400	20000	NA	6/27/11 17:54		251477	
Chloromethane	100000	U	100000	4800	20000	NA	6/27/11 17:54		251477	
Cyclohexane	200000	U	200000	4800	20000	NA	6/27/11 17:54		251477	
Dibromochloromethane	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	6/27/11 17:54		251477	
Dichloromethane	100000	U	100000	4400	20000	NA	6/27/11 17:54		251477	
Ethylbenzene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Methyl Acetate	200000	U	200000	4600	20000	NA	6/27/11 17:54		251477	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH26-20110621-1725
Lab Code: R1103564-003

Service Request: R1103564
Date Collected: 6/21/11 1725
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Methylcyclohexane	200000	U	200000	5000	20000	NA	6/27/11 17:54		251477	
Styrene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Toluene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	6/27/11 17:54		251477	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
Vinyl Chloride	100000	U	100000	4600	20000	NA	6/27/11 17:54		251477	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
m,p-Xylenes	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
n-Butyl Acetate	2200000		100000	4200	20000	NA	6/27/11 17:54		251477	
o-Xylene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 17:54		251477	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	6/27/11 17:54	
Dibromofluoromethane	106	89-119	6/27/11 17:54	
Toluene-d8	106	87-121	6/27/11 17:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH29-20110622-0745
Lab Code: R1103564-004

Service Request: R1103564
Date Collected: 6/22/11 0745
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	70.9	mg/L	2.0	20	NA	6/27/11 17:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH29-20110622-0745
Lab Code: R1103564-004

Service Request: R1103564
Date Collected: 6/22/11 0745
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	6/27/11 18:24		251477	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	6/27/11 18:24		251477	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	6/27/11 18:24		251477	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	6/27/11 18:24		251477	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	6/27/11 18:24		251477	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	6/27/11 18:24		251477	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	6/27/11 18:24		251477	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
n-Butanol	1000000	U	1000000	210000	20000	NA	6/27/11 18:24		251477	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	6/27/11 18:24		251477	
2-Hexanone	200000	U	200000	7000	20000	NA	6/27/11 18:24		251477	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	6/27/11 18:24		251477	
Acetone	400000	U	400000	20000	20000	NA	6/27/11 18:24		251477	
Benzene	100000	U	100000	4200	20000	NA	6/27/11 18:24		251477	
Bromodichloromethane	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Bromoform	100000	U	100000	5400	20000	NA	6/27/11 18:24		251477	
Bromomethane	100000	U	100000	6200	20000	NA	6/27/11 18:24		251477	
Carbon Disulfide	200000	U	200000	4000	20000	NA	6/27/11 18:24		251477	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	6/27/11 18:24		251477	
Chlorobenzene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Chloroethane	100000	U	100000	6200	20000	NA	6/27/11 18:24		251477	
Chloroform	100000	U	100000	4400	20000	NA	6/27/11 18:24		251477	
Chloromethane	100000	U	100000	4800	20000	NA	6/27/11 18:24		251477	
Cyclohexane	200000	U	200000	4800	20000	NA	6/27/11 18:24		251477	
Dibromochloromethane	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	6/27/11 18:24		251477	
Dichloromethane	100000	U	100000	4400	20000	NA	6/27/11 18:24		251477	
Ethylbenzene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Methyl Acetate	200000	U	200000	4600	20000	NA	6/27/11 18:24		251477	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH29-20110622-0745
Lab Code: R1103564-004

Service Request: R1103564
Date Collected: 6/22/11 0745
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Methylcyclohexane	200000	U	200000	5000	20000	NA	6/27/11 18:24		251477	
Styrene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Toluene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	6/27/11 18:24		251477	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
Vinyl Chloride	100000	U	100000	4600	20000	NA	6/27/11 18:24		251477	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
m,p-Xylenes	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
n-Butyl Acetate	2500000		100000	4200	20000	NA	6/27/11 18:24		251477	
o-Xylene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/27/11 18:24		251477	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	6/27/11 18:24	
Dibromofluoromethane	105	89-119	6/27/11 18:24	
Toluene-d8	106	87-121	6/27/11 18:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH39-20110622-1150
Lab Code: R1103564-005

Service Request: R1103564
Date Collected: 6/22/11 1150
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	88.1	mg/L	3.0	30	NA	6/27/11 18:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: BATCH39-20110622-1150
 Lab Code: R1103564-005

Service Request: R1103564
 Date Collected: 6/22/11 1150
 Date Received: 6/24/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250000	U	250000	12000	50000	NA	6/28/11 13:53		251657	
1,1,2,2-Tetrachloroethane	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,1,2-Trichloroethane	250000	U	250000	12000	50000	NA	6/28/11 13:53		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	250000	U	250000	16000	50000	NA	6/28/11 13:53		251657	
1,1-Dichloroethane (1,1-DCA)	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,1-Dichloroethene (1,1-DCE)	250000	U	250000	15000	50000	NA	6/28/11 13:53		251657	
1,2,4-Trichlorobenzene	20000	BJ	250000	13000	50000	NA	6/28/11 13:53		251657	
1,2-Dibromo-3-chloropropane (DBCP)	250000	U	250000	19000	50000	NA	6/28/11 13:53		251657	
1,2-Dibromoethane	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,2-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,2-Dichloroethane	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,2-Dichloropropane	250000	U	250000	15000	50000	NA	6/28/11 13:53		251657	
1,3-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
1,4-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
n-Butanol	2500000	U	2500000	530000	50000	NA	6/28/11 13:53		251657	
2-Butanone (MEK)	500000	U	500000	26000	50000	NA	6/28/11 13:53		251657	
2-Hexanone	500000	U	500000	18000	50000	NA	6/28/11 13:53		251657	
4-Methyl-2-pentanone	500000	U	500000	14000	50000	NA	6/28/11 13:53		251657	
Acetone	1000000	U	1000000	49000	50000	NA	6/28/11 13:53		251657	
Benzene	250000	U	250000	11000	50000	NA	6/28/11 13:53		251657	
Bromodichloromethane	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Bromoform	250000	U	250000	14000	50000	NA	6/28/11 13:53		251657	
Bromomethane	250000	U	250000	16000	50000	NA	6/28/11 13:53		251657	
Carbon Disulfide	500000	U	500000	10000	50000	NA	6/28/11 13:53		251657	
Carbon Tetrachloride	250000	U	250000	14000	50000	NA	6/28/11 13:53		251657	
Chlorobenzene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Chloroethane	250000	U	250000	16000	50000	NA	6/28/11 13:53		251657	
Chloroform	250000	U	250000	11000	50000	NA	6/28/11 13:53		251657	
Chloromethane	250000	U	250000	12000	50000	NA	6/28/11 13:53		251657	
Cyclohexane	500000	U	500000	12000	50000	NA	6/28/11 13:53		251657	
Dibromochloromethane	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Dichlorodifluoromethane (CFC 12)	250000	U	250000	29000	50000	NA	6/28/11 13:53		251657	
Dichloromethane	250000	U	250000	11000	50000	NA	6/28/11 13:53		251657	
Ethylbenzene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Isopropylbenzene (Cumene)	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Methyl Acetate	500000	U	500000	12000	50000	NA	6/28/11 13:53		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH39-20110622-1150
Lab Code: R1103564-005

Service Request: R1103564
Date Collected: 6/22/11 1150
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Methylcyclohexane	500000	U	500000	13000	50000	NA	6/28/11 13:53		251657	
Styrene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Tetrachloroethene (PCE)	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Toluene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Trichloroethene (TCE)	250000	U	250000	12000	50000	NA	6/28/11 13:53		251657	
Trichlorofluoromethane (CFC 11)	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
Vinyl Chloride	250000	U	250000	12000	50000	NA	6/28/11 13:53		251657	
cis-1,2-Dichloroethene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
cis-1,3-Dichloropropene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
m,p-Xylenes	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
n-Butyl Acetate	7700000		250000	11000	50000	NA	6/28/11 13:53		251657	
o-Xylene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
trans-1,2-Dichloroethene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	
trans-1,3-Dichloropropene	250000	U	250000	10000	50000	NA	6/28/11 13:53		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	6/28/11 13:53	
Dibromofluoromethane	107	89-119	6/28/11 13:53	
Toluene-d8	109	87-121	6/28/11 13:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH40-20110622-1458
Lab Code: R1103564-006

Service Request: R1103564
Date Collected: 6/22/11 1458
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	86.4	mg/L	3.0	30	NA	6/27/11 18:37	
Iodide	300.0	115	mg/L	20	100	NA	7/12/11 15:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH40-20110622-1458
Lab Code: R1103564-006

Service Request: R1103564
Date Collected: 6/22/11 1458
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130000	U	130000	5800	25000	NA	6/28/11 14:23		251657	
1,1,2,2-Tetrachloroethane	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,1,2-Trichloroethane	130000	U	130000	5800	25000	NA	6/28/11 14:23		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	130000	U	130000	7800	25000	NA	6/28/11 14:23		251657	
1,1-Dichloroethane (1,1-DCA)	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,1-Dichloroethene (1,1-DCE)	130000	U	130000	7300	25000	NA	6/28/11 14:23		251657	
1,2,4-Trichlorobenzene	130000	U	130000	6500	25000	NA	6/28/11 14:23		251657	
1,2-Dibromo-3-chloropropane (DBCP)	130000	U	130000	9500	25000	NA	6/28/11 14:23		251657	
1,2-Dibromoethane	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,2-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,2-Dichloroethane	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,2-Dichloropropane	130000	U	130000	7100	25000	NA	6/28/11 14:23		251657	
1,3-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
1,4-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
n-Butanol	1300000	U	1300000	270000	25000	NA	6/28/11 14:23		251657	
2-Butanone (MEK)	250000	U	250000	13000	25000	NA	6/28/11 14:23		251657	
2-Hexanone	250000	U	250000	8800	25000	NA	6/28/11 14:23		251657	
4-Methyl-2-pentanone	250000	U	250000	6800	25000	NA	6/28/11 14:23		251657	
Acetone	500000	U	500000	25000	25000	NA	6/28/11 14:23		251657	
Benzene	130000	U	130000	5300	25000	NA	6/28/11 14:23		251657	
Bromodichloromethane	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Bromoform	130000	U	130000	6800	25000	NA	6/28/11 14:23		251657	
Bromomethane	130000	U	130000	7800	25000	NA	6/28/11 14:23		251657	
Carbon Disulfide	250000	U	250000	5000	25000	NA	6/28/11 14:23		251657	
Carbon Tetrachloride	130000	U	130000	6800	25000	NA	6/28/11 14:23		251657	
Chlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Chloroethane	130000	U	130000	7800	25000	NA	6/28/11 14:23		251657	
Chloroform	130000	U	130000	5500	25000	NA	6/28/11 14:23		251657	
Chloromethane	130000	U	130000	6000	25000	NA	6/28/11 14:23		251657	
Cyclohexane	250000	U	250000	6000	25000	NA	6/28/11 14:23		251657	
Dibromochloromethane	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Dichlorodifluoromethane (CFC 12)	130000	U	130000	15000	25000	NA	6/28/11 14:23		251657	
Dichloromethane	130000	U	130000	5500	25000	NA	6/28/11 14:23		251657	
Ethylbenzene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Isopropylbenzene (Cumene)	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Methyl Acetate	250000	U	250000	5800	25000	NA	6/28/11 14:23		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH40-20110622-1458
Lab Code: R1103564-006

Service Request: R1103564
Date Collected: 6/22/11 1458
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Methylcyclohexane	250000	U	250000	6300	25000	NA	6/28/11 14:23		251657	
Styrene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Tetrachloroethene (PCE)	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Toluene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Trichloroethene (TCE)	130000	U	130000	5800	25000	NA	6/28/11 14:23		251657	
Trichlorofluoromethane (CFC 11)	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
Vinyl Chloride	130000	U	130000	5800	25000	NA	6/28/11 14:23		251657	
cis-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
cis-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
m,p-Xylenes	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
n-Butyl Acetate	4700000		130000	5300	25000	NA	6/28/11 14:23		251657	
o-Xylene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
trans-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	
trans-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	6/28/11 14:23		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	6/28/11 14:23	
Dibromofluoromethane	106	89-119	6/28/11 14:23	
Toluene-d8	107	87-121	6/28/11 14:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH49-20110622-1655
Lab Code: R1103564-007

Service Request: R1103564
Date Collected: 6/22/11 1655
Date Received: 6/24/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	72.4	mg/L	3.0	30	NA	6/27/11 19:34	
Iodide	300.0	146	mg/L	20	100	NA	7/12/11 15:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH49-20110622-1655
Lab Code: R1103564-007

Service Request: R1103564
Date Collected: 6/22/11 1655
Date Received: 6/24/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250000	U	250000	12000	50000	NA	6/27/11 19:54		251477	
1,1,2,2-Tetrachloroethane	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,1,2-Trichloroethane	250000	U	250000	12000	50000	NA	6/27/11 19:54		251477	
1,1,2-Trichloro-1,2,2-trifluoroethane	250000	U	250000	16000	50000	NA	6/27/11 19:54		251477	
1,1-Dichloroethane (1,1-DCA)	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,1-Dichloroethene (1,1-DCE)	250000	U	250000	15000	50000	NA	6/27/11 19:54		251477	
1,2,4-Trichlorobenzene	250000	U	250000	13000	50000	NA	6/27/11 19:54		251477	
1,2-Dibromo-3-chloropropane (DBCP)	250000	U	250000	19000	50000	NA	6/27/11 19:54		251477	
1,2-Dibromoethane	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,2-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,2-Dichloroethane	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,2-Dichloropropane	250000	U	250000	15000	50000	NA	6/27/11 19:54		251477	
1,3-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
1,4-Dichlorobenzene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
n-Butanol	2500000	U	2500000	530000	50000	NA	6/27/11 19:54		251477	
2-Butanone (MEK)	500000	U	500000	26000	50000	NA	6/27/11 19:54		251477	
2-Hexanone	500000	U	500000	18000	50000	NA	6/27/11 19:54		251477	
4-Methyl-2-pentanone	500000	U	500000	14000	50000	NA	6/27/11 19:54		251477	
Acetone	1000000	U	1000000	49000	50000	NA	6/27/11 19:54		251477	
Benzene	250000	U	250000	11000	50000	NA	6/27/11 19:54		251477	
Bromodichloromethane	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Bromoform	250000	U	250000	14000	50000	NA	6/27/11 19:54		251477	
Bromomethane	250000	U	250000	16000	50000	NA	6/27/11 19:54		251477	
Carbon Disulfide	500000	U	500000	10000	50000	NA	6/27/11 19:54		251477	
Carbon Tetrachloride	250000	U	250000	14000	50000	NA	6/27/11 19:54		251477	
Chlorobenzene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Chloroethane	250000	U	250000	16000	50000	NA	6/27/11 19:54		251477	
Chloroform	250000	U	250000	11000	50000	NA	6/27/11 19:54		251477	
Chloromethane	250000	U	250000	12000	50000	NA	6/27/11 19:54		251477	
Cyclohexane	500000	U	500000	12000	50000	NA	6/27/11 19:54		251477	
Dibromochloromethane	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Dichlorodifluoromethane (CFC 12)	250000	U	250000	29000	50000	NA	6/27/11 19:54		251477	
Dichloromethane	250000	U	250000	11000	50000	NA	6/27/11 19:54		251477	
Ethylbenzene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Isopropylbenzene (Cumene)	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Methyl Acetate	500000	U	500000	12000	50000	NA	6/27/11 19:54		251477	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH49-20110622-1655
Lab Code: R1103564-007

Service Request: R1103564
Date Collected: 6/22/11 1655
Date Received: 6/24/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Methylcyclohexane	500000	U	500000	13000	50000	NA	6/27/11 19:54		251477	
Styrene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Tetrachloroethene (PCE)	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Toluene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Trichloroethene (TCE)	250000	U	250000	12000	50000	NA	6/27/11 19:54		251477	
Trichlorofluoromethane (CFC 11)	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
Vinyl Chloride	250000	U	250000	12000	50000	NA	6/27/11 19:54		251477	
cis-1,2-Dichloroethene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
cis-1,3-Dichloropropene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
m,p-Xylenes	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
n-Butyl Acetate	6600000		250000	11000	50000	NA	6/27/11 19:54		251477	
o-Xylene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
trans-1,2-Dichloroethene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	
trans-1,3-Dichloropropene	250000	U	250000	10000	50000	NA	6/27/11 19:54		251477	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	6/27/11 19:54	
Dibromofluoromethane	105	89-119	6/27/11 19:54	
Toluene-d8	109	87-121	6/27/11 19:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103564-MB1

Service Request: R1103564
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	6/27/11 12:13	
Iodide	300.0	0.20 U	mg/L	0.20	1	NA	7/12/11 13:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103564-MB2

Service Request: R1103564
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U mg/L	0.10	I	NA	6/27/11 17:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106213-04

Service Request: R1103564
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/27/11 15:23		251477	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/27/11 15:23		251477	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	6/27/11 15:23		251477	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	6/27/11 15:23		251477	
1,2,4-Trichlorobenzene	0.37	J	5.0	0.26	1	NA	6/27/11 15:23		251477	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/27/11 15:23		251477	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/27/11 15:23		251477	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
n-Butanol	50	U	50	11	1	NA	6/27/11 15:23		251477	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/27/11 15:23		251477	
2-Hexanone	10	U	10	0.35	1	NA	6/27/11 15:23		251477	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/27/11 15:23		251477	
Acetone	20	U	20	0.98	1	NA	6/27/11 15:23		251477	
Benzene	5.0	U	5.0	0.21	1	NA	6/27/11 15:23		251477	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Bromoform	5.0	U	5.0	0.27	1	NA	6/27/11 15:23		251477	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/27/11 15:23		251477	
Carbon Disulfide	10	U	10	0.20	1	NA	6/27/11 15:23		251477	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/27/11 15:23		251477	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/27/11 15:23		251477	
Chloroform	5.0	U	5.0	0.22	1	NA	6/27/11 15:23		251477	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/27/11 15:23		251477	
Cyclohexane	10	U	10	0.24	1	NA	6/27/11 15:23		251477	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/27/11 15:23		251477	
Dichloromethane	5.0	U	5.0	0.22	1	NA	6/27/11 15:23		251477	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Methyl Acetate	10	U	10	0.23	1	NA	6/27/11 15:23		251477	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106213-04

Service Request: R1103564
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251477

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Methylcyclohexane	10	U	10	0.25	1	NA	6/27/11 15:23		251477	
Styrene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Toluene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	6/27/11 15:23		251477	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	6/27/11 15:23		251477	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/27/11 15:23		251477	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/27/11 15:23		251477	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	6/27/11 15:23	
Dibromofluoromethane	107	89-119	6/27/11 15:23	
Toluene-d8	107	87-121	6/27/11 15:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106262-04

Service Request: R1103564
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	6/28/11 12:22		251657	
1,2,4-Trichlorobenzene	0.36	J	5.0	0.26	1	NA	6/28/11 12:22		251657	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/28/11 12:22		251657	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/28/11 12:22		251657	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
n-Butanol	50	U	50	11	1	NA	6/28/11 12:22		251657	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/28/11 12:22		251657	
2-Hexanone	10	U	10	0.35	1	NA	6/28/11 12:22		251657	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/28/11 12:22		251657	
Acetone	20	U	20	0.98	1	NA	6/28/11 12:22		251657	
Benzene	5.0	U	5.0	0.21	1	NA	6/28/11 12:22		251657	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Bromoform	5.0	U	5.0	0.27	1	NA	6/28/11 12:22		251657	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
Carbon Disulfide	10	U	10	0.20	1	NA	6/28/11 12:22		251657	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/28/11 12:22		251657	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
Chloroform	0.52	J	5.0	0.22	1	NA	6/28/11 12:22		251657	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/28/11 12:22		251657	
Cyclohexane	10	U	10	0.24	1	NA	6/28/11 12:22		251657	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/28/11 12:22		251657	
Dichloromethane	5.0	U	5.0	0.22	1	NA	6/28/11 12:22		251657	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Methyl Acetate	10	U	10	0.23	1	NA	6/28/11 12:22		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106262-04

Service Request: R1103564
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Methylcyclohexane	10	U	10	0.25	1	NA	6/28/11 12:22		251657	
Styrene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Toluene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/28/11 12:22		251657	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	6/28/11 12:22	
Dibromofluoromethane	107	89-119	6/28/11 12:22	
Toluene-d8	108	87-121	6/28/11 12:22	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/27/11 -
7/12/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103564-LCS1			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Iodide	300.0	0.958	1.00	96	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/27/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103564-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.03	1.00	103	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/27/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 251477

**Lab Control Sample
 RQ1106213-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.4	20.0	92	72 - 128
1,1,2,2-Tetrachloroethane	19.8	20.0	99	72 - 131
1,1,2-Trichloroethane	21.0	20.0	105	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.0	20.0	95	71 - 134
1,1-Dichloroethane (1,1-DCA)	20.2	20.0	101	76 - 122
1,1-Dichloroethene (1,1-DCE)	18.1	20.0	90	72 - 129
1,2,4-Trichlorobenzene	22.2	20.0	111	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.5	20.0	108	62 - 131
1,2-Dibromoethane	19.7	20.0	98	78 - 125
1,2-Dichlorobenzene	20.6	20.0	103	79 - 124
1,2-Dichloroethane	19.5	20.0	98	78 - 126
1,2-Dichloropropane	20.2	20.0	101	80 - 123
1,3-Dichlorobenzene	20.8	20.0	104	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	1080	1000	108	70 - 130
2-Butanone (MEK)	22.2	20.0	111	60 - 133
2-Hexanone	20.0	20.0	100	61 - 131
4-Methyl-2-pentanone	20.6	20.0	103	61 - 132
Acetone	21.5	20.0	107	59 - 140
Benzene	20.0	20.0	100	78 - 121
Bromodichloromethane	20.9	20.0	104	80 - 125
Bromoform	21.3	20.0	107	73 - 132
Bromomethane	18.1	20.0	91	57 - 144
Carbon Disulfide	17.1	20.0	86	59 - 138
Carbon Tetrachloride	18.9	20.0	95	69 - 135
Chlorobenzene	20.8	20.0	104	80 - 121
Chloroethane	19.3	20.0	97	71 - 130
Chloroform	19.1	20.0	95	78 - 125
Chloromethane	20.1	20.0	101	62 - 133
Cyclohexane	16.3	20.0	82	67 - 127
Dibromochloromethane	20.7	20.0	104	78 - 133
Dichlorodifluoromethane (CFC 12)	21.8	20.0	109	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/27/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 251477

**Lab Control Sample
 RQ1106213-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.7	20.0	94	75 - 125
Ethylbenzene	19.7	20.0	98	78 - 123
Isopropylbenzene (Cumene)	22.9	20.0	115	73 - 133
Methyl Acetate	18.8	20.0	94	57 - 157
Methyl tert-Butyl Ether	19.6	20.0	98	75 - 126
Methylcyclohexane	16.5	20.0	83	64 - 133
Styrene	21.2	20.0	106	80 - 132
Tetrachloroethene (PCE)	20.2	20.0	101	72 - 131
Toluene	20.4	20.0	102	78 - 122
Trichloroethene (TCE)	20.2	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	19.1	20.0	96	71 - 139
Vinyl Chloride	19.6	20.0	98	71 - 136
cis-1,2-Dichloroethene	20.0	20.0	100	78 - 122
cis-1,3-Dichloropropene	20.3	20.0	101	77 - 125
m,p-Xylenes	41.4	40.0	104	79 - 126
n-Butyl Acetate	19.8	20.0	99	54 - 127
o-Xylene	20.1	20.0	100	79 - 126
trans-1,2-Dichloroethene	19.0	20.0	95	75 - 121
trans-1,3-Dichloropropene	20.0	20.0	100	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 251657

**Lab Control Sample
 RQ1106262-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.5	20.0	82	72 - 128
1,1,1,2-Tetrachloroethane	20.5	20.0	103	72 - 131
1,1,2-Trichloroethane	21.0	20.0	105	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.6	20.0	83	71 - 134
1,1-Dichloroethane (1,1-DCA)	19.7	20.0	99	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.7	20.0	84	72 - 129
1,2,4-Trichlorobenzene	21.0	20.0	105	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	20.7	20.0	103	62 - 131
1,2-Dibromoethane	20.6	20.0	103	78 - 125
1,2-Dichlorobenzene	20.7	20.0	103	79 - 124
1,2-Dichloroethane	20.0	20.0	100	78 - 126
1,2-Dichloropropane	19.3	20.0	97	80 - 123
1,3-Dichlorobenzene	20.6	20.0	103	78 - 124
1,4-Dichlorobenzene	19.9	20.0	99	78 - 123
n-Butanol	1080	1000	108	70 - 130
2-Butanone (MEK)	20.7	20.0	104	60 - 133
2-Hexanone	20.2	20.0	101	61 - 131
4-Methyl-2-pentanone	20.6	20.0	103	61 - 132
Acetone	21.0	20.0	105	59 - 140
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	20.6	20.0	103	80 - 125
Bromoform	22.7	20.0	114	73 - 132
Bromomethane	17.0	20.0	85	57 - 144
Carbon Disulfide	15.8	20.0	79	59 - 138
Carbon Tetrachloride	17.1	20.0	85	69 - 135
Chlorobenzene	20.0	20.0	100	80 - 121
Chloroethane	18.8	20.0	94	71 - 130
Chloroform	18.5	20.0	92	78 - 125
Chloromethane	19.1	20.0	95	62 - 133
Cyclohexane	17.3	20.0	86	67 - 127
Dibromochloromethane	22.0	20.0	110	78 - 133
Dichlorodifluoromethane (CFC 12)	19.3	20.0	96	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103564
Date Analyzed: 6/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 251657

**Lab Control Sample
 RQ1106262-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.7	20.0	98	75 - 125
Ethylbenzene	18.0	20.0	90	78 - 123
Isopropylbenzene (Cumene)	21.4	20.0	107	73 - 133
Methyl Acetate	19.1	20.0	95	57 - 157
Methyl tert-Butyl Ether	20.2	20.0	101	75 - 126
Methylcyclohexane	17.4	20.0	87	64 - 133
Styrene	20.5	20.0	102	80 - 132
Tetrachloroethene (PCE)	18.3	20.0	92	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	18.6	20.0	93	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	71 - 139
Vinyl Chloride	18.2	20.0	91	71 - 136
cis-1,2-Dichloroethene	19.2	20.0	96	78 - 122
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	38.5	40.0	96	79 - 126
n-Butyl Acetate	20.3	20.0	102	54 - 127
o-Xylene	19.1	20.0	96	79 - 126
trans-1,2-Dichloroethene	18.1	20.0	90	75 - 121
trans-1,3-Dichloropropene	20.6	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Project Name LC34 P40		Project Number TR0272		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager CORY BERTH		Report CC		PRESERVATIVE	
Company/Address GEOSYNTEC (GUYARD)				METALS, TOTAL (List in comments below)	
Phone # 519-822-2230 ext 224		E-mail		METALS DISSOLVED (List in comments below)	
Sample Signature [Signature]		Sampler's Printed Name JOSEPH BARTLETT		PCBs <input type="checkbox"/> 8082 <input type="checkbox"/> 608	
CLIENT SAMPLE ID		FOR OFFICE USE ONLY LAB ID		PESTICIDES <input type="checkbox"/> 8081 <input type="checkbox"/> 608	
BATCH 10 - 20110621-0825	-001	6/21/11 0825	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 17 - 20110621-1127	-002	6/21/11 1127	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 26 - 20110621-1725	-003	6/21/11 1725	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 29 - 20110622-0745	-004	6/22/11 0745	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 39 - 20110622-1150	-005	6/22/11 1150	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 40 - 20110622-1458	-006	6/22/11 1458	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 49 - 20110622-1655	-007	6/22/11 1655	W	GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
TEST BLANK	HOLD B			GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
SPECIAL INSTRUCTIONS/COMMENTS Metals		TURNAROUND REQUIREMENTS RUSH (SURCHARGES APPLY) 1 day <input type="checkbox"/> 2 day <input type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input type="checkbox"/> <input checked="" type="checkbox"/> Standard		REPORT REQUIREMENTS I. Results Only <input type="checkbox"/> II. Results + QC Summaries (LCS, DUP, MS/MSD as required) <input type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with F <input type="checkbox"/>	
RECEIVED BY [Signature] Signature Joseph Bartlett Printed Name Firm GeoSynTec Consultants Date/Time 6/23/11 1500		RECEIVED BY [Signature] Signature Joseph Bartlett Printed Name Firm GeoSynTec Consultants Date/Time 6/24/11 0920		RECEIVED BY [Signature] Signature Joseph Bartlett Printed Name Firm GeoSynTec Consultants Date/Time 6/24/11 0920	
PROJECT WHERE SAMPLES WERE COLLECTED: F		RECEIVED BY		RECEIVED BY	
RELINQUISHED BY [Signature] Signature Joseph Bartlett Printed Name Firm GeoSynTec Consultants Date/Time 6/23/11 1500		RELINQUISHED BY		RELINQUISHED BY	
See CAPP <input type="checkbox"/>		REQUESTED REPORT DATE		REQUESTED REPORT DATE	
INVOICE INFORMATION PO #: BILL TO:		R1103564 GeoSynTec Consultants LC34 PED		R1103564 GeoSynTec Consultants LC34 PED	
PRESERVATIVE KEY 0. NONE 1. HCL 2. HNO3 3. H2SO4 4. NaOH 5. Zn Acetate 6. MeOH 7. NaHSO4 8. Other 132		REMARKS/ALTERNATE DESCRIPTION		REMARKS/ALTERNATE DESCRIPTION	

Cooler Receipt And Preservation Check Form

Project/Client Seosyntec Folder Number R11-3564

Cooler received on 6/24/11 by: AP COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROO, CLIENT
7. Temperature of cooler(s) upon receipt: 3.8°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 6/24/11 0945

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 6/28/11

Cooler Breakdown: Date: 6/24/11 Time: 1125 by: AKH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 0-319-005, 053011-2V
Other Comments: _____

* for Test Blank - only vials for 8260 received no Br&I,
* for loc. BATCH 29-20110622-0745 bottle for Br&I labeled
BATCH 26-20110622-0745

PC Secondary Review: KB 7/26/11

*significant air bubbles: VOA > 5-6 mm ; WC > _____

July 25, 2011

Service Request No: R1103580

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 PED/TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on June 25, 2011. For your reference, these analyses have been assigned our service request number **R1103580**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 26

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1103580
Date Received: 6/25/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Three (3) water samples were collected by the client on 6/23/11 and were received for analysis at Columbia Analytical Services on 6/25/11 via a national courier. The "Test Blank" was placed on hold as per instructions in an email from the client on 6/24/11. The samples were received at a cooler temperature of 2.6°C within the guidelines of 0-6°C.

Volatile Organic Compounds

Three (3) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK) recoveries were all within QC limits except for Isopropylbenzene which was outside limits high (134%, limit 133%) on the 6/29/11 analytical run. The recovery has been flagged as "**".

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

No samples required reanalysis for overrange compounds. The sample data is reported in a merged format to be consistent with other reports for this project.

All samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination except for a 1,2,4-Trichlorobenzene hit in the 6/29/11 blank and 1,2,4-Trichlorobenzene and Chloroform hits in the 6/28/11 blank. No data required "B" flags however.

No other analytical or QC problems were encountered.

Inorganic Parameters

Three (3) water samples were analyzed for Bromide and one (1) sample was analyzed for Iodide by IC method 300.0.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

Approved by



Date

7/26/11

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by Karen Benker Date 7/26/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1103580

<u>Lab ID</u>	<u>Client ID</u>
R1103580-001	BATCH54-20116923-0750
R1103580-002	BATCH57-20110623-1150
R1103580-003	BATCH67-20110623-1540

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH54-20116923-0750
Lab Code: R1103580-001

Service Request: R1103580
Date Collected: 6/23/11 0750
Date Received: 6/25/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	64.8	mg/L	3.0	30	NA	6/27/11 18:51	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH54-20116923-0750
Lab Code: R1103580-001

Service Request: R1103580
Date Collected: 6/23/11 0750
Date Received: 6/25/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130000	U	130000	5800	25000	NA	6/28/11 14:53		251657	
1,1,2,2-Tetrachloroethane	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,1,2-Trichloroethane	130000	U	130000	5800	25000	NA	6/28/11 14:53		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	130000	U	130000	7800	25000	NA	6/28/11 14:53		251657	
1,1-Dichloroethane (1,1-DCA)	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,1-Dichloroethene (1,1-DCE)	130000	U	130000	7300	25000	NA	6/28/11 14:53		251657	
1,2,4-Trichlorobenzene	130000	U	130000	6500	25000	NA	6/28/11 14:53		251657	
1,2-Dibromo-3-chloropropane (DBCP)	130000	U	130000	9500	25000	NA	6/28/11 14:53		251657	
1,2-Dibromoethane	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,2-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,2-Dichloroethane	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,2-Dichloropropane	130000	U	130000	7100	25000	NA	6/28/11 14:53		251657	
1,3-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
1,4-Dichlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
n-Butanol	1300000	U	1300000	270000	25000	NA	6/28/11 14:53		251657	
2-Butanone (MEK)	250000	U	250000	13000	25000	NA	6/28/11 14:53		251657	
2-Hexanone	250000	U	250000	8800	25000	NA	6/28/11 14:53		251657	
4-Methyl-2-pentanone	250000	U	250000	6800	25000	NA	6/28/11 14:53		251657	
Acetone	500000	U	500000	25000	25000	NA	6/28/11 14:53		251657	
Benzene	130000	U	130000	5300	25000	NA	6/28/11 14:53		251657	
Bromodichloromethane	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Bromoform	130000	U	130000	6800	25000	NA	6/28/11 14:53		251657	
Bromomethane	130000	U	130000	7800	25000	NA	6/28/11 14:53		251657	
Carbon Disulfide	250000	U	250000	5000	25000	NA	6/28/11 14:53		251657	
Carbon Tetrachloride	130000	U	130000	6800	25000	NA	6/28/11 14:53		251657	
Chlorobenzene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Chloroethane	130000	U	130000	7800	25000	NA	6/28/11 14:53		251657	
Chloroform	130000	U	130000	5500	25000	NA	6/28/11 14:53		251657	
Chloromethane	130000	U	130000	6000	25000	NA	6/28/11 14:53		251657	
Cyclohexane	250000	U	250000	6000	25000	NA	6/28/11 14:53		251657	
Dibromochloromethane	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Dichlorodifluoromethane (CFC 12)	130000	U	130000	15000	25000	NA	6/28/11 14:53		251657	
Dichloromethane	130000	U	130000	5500	25000	NA	6/28/11 14:53		251657	
Ethylbenzene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Isopropylbenzene (Cumene)	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Methyl Acetate	250000	U	250000	5800	25000	NA	6/28/11 14:53		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH54-20116923-0750
Lab Code: R1103580-001

Service Request: R1103580
Date Collected: 6/23/11 0750
Date Received: 6/25/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Methylcyclohexane	250000	U	250000	6300	25000	NA	6/28/11 14:53		251657	
Styrene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Tetrachloroethene (PCE)	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Toluene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Trichloroethene (TCE)	130000	U	130000	5800	25000	NA	6/28/11 14:53		251657	
Trichlorofluoromethane (CFC 11)	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
Vinyl Chloride	130000	U	130000	5800	25000	NA	6/28/11 14:53		251657	
cis-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
cis-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
m,p-Xylenes	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
n-Butyl Acetate	3400000		130000	5300	25000	NA	6/28/11 14:53		251657	
o-Xylene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
trans-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	
trans-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	6/28/11 14:53		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	6/28/11 14:53	
Dibromofluoromethane	107	89-119	6/28/11 14:53	
Toluene-d8	107	87-121	6/28/11 14:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH57-20110623-1150
Lab Code: R1103580-002

Service Request: R1103580
Date Collected: 6/23/11 1150
Date Received: 6/25/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	64.9	mg/L	3.0	30	NA	6/27/11 19:05	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH57-20110623-1150
Lab Code: R1103580-002

Service Request: R1103580
Date Collected: 6/23/11 1150
Date Received: 6/25/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	6/28/11 15:24		251657	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	6/28/11 15:24		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	6/28/11 15:24		251657	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	6/28/11 15:24		251657	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	6/28/11 15:24		251657	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	6/28/11 15:24		251657	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	6/28/11 15:24		251657	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
n-Butanol	1000000	U	1000000	210000	20000	NA	6/28/11 15:24		251657	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	6/28/11 15:24		251657	
2-Hexanone	200000	U	200000	7000	20000	NA	6/28/11 15:24		251657	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	6/28/11 15:24		251657	
Acetone	400000	U	400000	20000	20000	NA	6/28/11 15:24		251657	
Benzene	100000	U	100000	4200	20000	NA	6/28/11 15:24		251657	
Bromodichloromethane	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Bromoform	100000	U	100000	5400	20000	NA	6/28/11 15:24		251657	
Bromomethane	100000	U	100000	6200	20000	NA	6/28/11 15:24		251657	
Carbon Disulfide	200000	U	200000	4000	20000	NA	6/28/11 15:24		251657	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	6/28/11 15:24		251657	
Chlorobenzene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Chloroethane	100000	U	100000	6200	20000	NA	6/28/11 15:24		251657	
Chloroform	100000	U	100000	4400	20000	NA	6/28/11 15:24		251657	
Chloromethane	100000	U	100000	4800	20000	NA	6/28/11 15:24		251657	
Cyclohexane	200000	U	200000	4800	20000	NA	6/28/11 15:24		251657	
Dibromochloromethane	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	6/28/11 15:24		251657	
Dichloromethane	100000	U	100000	4400	20000	NA	6/28/11 15:24		251657	
Ethylbenzene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Methyl Acetate	200000	U	200000	4600	20000	NA	6/28/11 15:24		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH57-20110623-1150
Lab Code: R1103580-002

Service Request: R1103580
Date Collected: 6/23/11 1150
Date Received: 6/25/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Methylcyclohexane	200000	U	200000	5000	20000	NA	6/28/11 15:24		251657	
Styrene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Toluene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	6/28/11 15:24		251657	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
Vinyl Chloride	100000	U	100000	4600	20000	NA	6/28/11 15:24		251657	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
m,p-Xylenes	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
n-Butyl Acetate	2400000		100000	4200	20000	NA	6/28/11 15:24		251657	
o-Xylene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	6/28/11 15:24		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	6/28/11 15:24	
Dibromofluoromethane	106	89-119	6/28/11 15:24	
Toluene-d8	107	87-121	6/28/11 15:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH67-20110623-1540
Lab Code: R1103580-003

Service Request: R1103580
Date Collected: 6/23/11 1540
Date Received: 6/25/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	70.7	mg/L	3.0	30	NA	6/27/11 19:19	
Iodide	300.0	102	mg/L	20	100	NA	7/12/11 15:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH67-20110623-1540
Lab Code: R1103580-003

Service Request: R1103580
Date Collected: 6/23/11 1540
Date Received: 6/25/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251815

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	6/29/11 13:39		251815	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	6/29/11 13:39		251815	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	6/29/11 13:39		251815	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	6/29/11 13:39		251815	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	6/29/11 13:39		251815	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	6/29/11 13:39		251815	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	6/29/11 13:39		251815	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
n-Butanol	500000	U	500000		10000	NA	6/29/11 13:39		251815	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	6/29/11 13:39		251815	
2-Hexanone	100000	U	100000	3500	10000	NA	6/29/11 13:39		251815	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	6/29/11 13:39		251815	
Acetone	200000	U	200000	9800	10000	NA	6/29/11 13:39		251815	
Benzene	50000	U	50000	2100	10000	NA	6/29/11 13:39		251815	
Bromodichloromethane	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Bromoform	50000	U	50000	2700	10000	NA	6/29/11 13:39		251815	
Bromomethane	50000	U	50000	3100	10000	NA	6/29/11 13:39		251815	
Carbon Disulfide	100000	U	100000	2000	10000	NA	6/29/11 13:39		251815	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	6/29/11 13:39		251815	
Chlorobenzene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Chloroethane	50000	U	50000	3100	10000	NA	6/29/11 13:39		251815	
Chloroform	50000	U	50000	2200	10000	NA	6/29/11 13:39		251815	
Chloromethane	50000	U	50000	2400	10000	NA	6/29/11 13:39		251815	
Cyclohexane	100000	U	100000	2400	10000	NA	6/29/11 13:39		251815	
Dibromochloromethane	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	6/29/11 13:39		251815	
Dichloromethane	50000	U	50000	2200	10000	NA	6/29/11 13:39		251815	
Ethylbenzene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Methyl Acetate	100000	U	100000	2300	10000	NA	6/29/11 13:39		251815	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: BATCH67-20110623-1540
Lab Code: R1103580-003

Service Request: R1103580
Date Collected: 6/23/11 1540
Date Received: 6/25/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251815

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Methylcyclohexane	100000	U	100000	2500	10000	NA	6/29/11 13:39		251815	
Styrene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Toluene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	6/29/11 13:39		251815	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
Vinyl Chloride	50000	U	50000	2300	10000	NA	6/29/11 13:39		251815	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
m,p-Xylenes	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
n-Butyl Acetate	1700000		50000	2100	10000	NA	6/29/11 13:39		251815	
o-Xylene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	6/29/11 13:39		251815	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	6/29/11 13:39	
Dibromofluoromethane	106	89-119	6/29/11 13:39	
Toluene-d8	107	87-121	6/29/11 13:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103580-MB

Service Request: R1103580
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	6/27/11 17:54	
Iodide	300.0	0.20 U	mg/L	0.20	1	NA	7/12/11 13:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106262-04

Service Request: R1103580
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	6/28/11 12:22		251657	
1,2,4-Trichlorobenzene	0.36	J	5.0	0.26	1	NA	6/28/11 12:22		251657	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/28/11 12:22		251657	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/28/11 12:22		251657	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
n-Butanol	50	U	50	11	1	NA	6/28/11 12:22		251657	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/28/11 12:22		251657	
2-Hexanone	10	U	10	0.35	1	NA	6/28/11 12:22		251657	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/28/11 12:22		251657	
Acetone	20	U	20	0.98	1	NA	6/28/11 12:22		251657	
Benzene	5.0	U	5.0	0.21	1	NA	6/28/11 12:22		251657	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Bromoform	5.0	U	5.0	0.27	1	NA	6/28/11 12:22		251657	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
Carbon Disulfide	10	U	10	0.20	1	NA	6/28/11 12:22		251657	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/28/11 12:22		251657	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/28/11 12:22		251657	
Chloroform	0.52	J	5.0	0.22	1	NA	6/28/11 12:22		251657	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/28/11 12:22		251657	
Cyclohexane	10	U	10	0.24	1	NA	6/28/11 12:22		251657	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/28/11 12:22		251657	
Dichloromethane	5.0	U	5.0	0.22	1	NA	6/28/11 12:22		251657	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Methyl Acetate	10	U	10	0.23	1	NA	6/28/11 12:22		251657	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106262-04

Service Request: R1103580
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251657

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Methylcyclohexane	10	U	10	0.25	1	NA	6/28/11 12:22		251657	
Styrene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Toluene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	6/28/11 12:22		251657	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/28/11 12:22		251657	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/28/11 12:22		251657	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	6/28/11 12:22	
Dibromofluoromethane	107	89-119	6/28/11 12:22	
Toluene-d8	108	87-121	6/28/11 12:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106319-04

Service Request: R1103580
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251815

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/29/11 12:37		251815	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/29/11 12:37		251815	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	6/29/11 12:37		251815	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	6/29/11 12:37		251815	
1,2,4-Trichlorobenzene	0.30	J	5.0	0.26	1	NA	6/29/11 12:37		251815	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/29/11 12:37		251815	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/29/11 12:37		251815	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
n-Butanol	50	U	50	11	1	NA	6/29/11 12:37		251815	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/29/11 12:37		251815	
2-Hexanone	10	U	10	0.35	1	NA	6/29/11 12:37		251815	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/29/11 12:37		251815	
Acetone	20	U	20	0.98	1	NA	6/29/11 12:37		251815	
Benzene	5.0	U	5.0	0.21	1	NA	6/29/11 12:37		251815	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Bromoform	5.0	U	5.0	0.27	1	NA	6/29/11 12:37		251815	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/29/11 12:37		251815	
Carbon Disulfide	10	U	10	0.20	1	NA	6/29/11 12:37		251815	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/29/11 12:37		251815	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/29/11 12:37		251815	
Chloroform	5.0	U	5.0	0.22	1	NA	6/29/11 12:37		251815	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/29/11 12:37		251815	
Cyclohexane	10	U	10	0.24	1	NA	6/29/11 12:37		251815	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/29/11 12:37		251815	
Dichloromethane	5.0	U	5.0	0.22	1	NA	6/29/11 12:37		251815	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Methyl Acetate	10	U	10	0.23	1	NA	6/29/11 12:37		251815	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106319-04

Service Request: R1103580
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 251815

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Methylcyclohexane	10	U	10	0.25	1	NA	6/29/11 12:37		251815	
Styrene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Toluene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	6/29/11 12:37		251815	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	6/29/11 12:37		251815	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/29/11 12:37		251815	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/29/11 12:37		251815	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	6/29/11 12:37	
Dibromofluoromethane	106	89-119	6/29/11 12:37	
Toluene-d8	108	87-121	6/29/11 12:37	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103580
Date Analyzed: 6/27/11 -
7/12/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103580-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.03	1.00	103	90 - 110
Iodide	300.0	0.958	1.00	96	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103580
Date Analyzed: 6/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 251657

**Lab Control Sample
 RQ1106262-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.5	20.0	82	72 - 128
1,1,1,2-Tetrachloroethane	20.5	20.0	103	72 - 131
1,1,2-Trichloroethane	21.0	20.0	105	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.6	20.0	83	71 - 134
1,1-Dichloroethane (1,1-DCA)	19.7	20.0	99	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.7	20.0	84	72 - 129
1,2,4-Trichlorobenzene	21.0	20.0	105	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	20.7	20.0	103	62 - 131
1,2-Dibromoethane	20.6	20.0	103	78 - 125
1,2-Dichlorobenzene	20.7	20.0	103	79 - 124
1,2-Dichloroethane	20.0	20.0	100	78 - 126
1,2-Dichloropropane	19.3	20.0	97	80 - 123
1,3-Dichlorobenzene	20.6	20.0	103	78 - 124
1,4-Dichlorobenzene	19.9	20.0	99	78 - 123
n-Butanol	1080	1000	108	70 - 130
2-Butanone (MEK)	20.7	20.0	104	60 - 133
2-Hexanone	20.2	20.0	101	61 - 131
4-Methyl-2-pentanone	20.6	20.0	103	61 - 132
Acetone	21.0	20.0	105	59 - 140
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	20.6	20.0	103	80 - 125
Bromoform	22.7	20.0	114	73 - 132
Bromomethane	17.0	20.0	85	57 - 144
Carbon Disulfide	15.8	20.0	79	59 - 138
Carbon Tetrachloride	17.1	20.0	85	69 - 135
Chlorobenzene	20.0	20.0	100	80 - 121
Chloroethane	18.8	20.0	94	71 - 130
Chloroform	18.5	20.0	92	78 - 125
Chloromethane	19.1	20.0	95	62 - 133
Cyclohexane	17.3	20.0	86	67 - 127
Dibromochloromethane	22.0	20.0	110	78 - 133
Dichlorodifluoromethane (CFC 12)	19.3	20.0	96	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103580
Date Analyzed: 6/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 251657

**Lab Control Sample
 RQ1106262-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.7	20.0	98	75 - 125
Ethylbenzene	18.0	20.0	90	78 - 123
Isopropylbenzene (Cumene)	21.4	20.0	107	73 - 133
Methyl Acetate	19.1	20.0	95	57 - 157
Methyl tert-Butyl Ether	20.2	20.0	101	75 - 126
Methylcyclohexane	17.4	20.0	87	64 - 133
Styrene	20.5	20.0	102	80 - 132
Tetrachloroethene (PCE)	18.3	20.0	92	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	18.6	20.0	93	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	71 - 139
Vinyl Chloride	18.2	20.0	91	71 - 136
cis-1,2-Dichloroethene	19.2	20.0	96	78 - 122
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	38.5	40.0	96	79 - 126
n-Butyl Acetate	20.3	20.0	102	54 - 127
o-Xylene	19.1	20.0	96	79 - 126
trans-1,2-Dichloroethene	18.1	20.0	90	75 - 121
trans-1,3-Dichloropropene	20.6	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED/TR0272
 Sample Matrix: Water

Service Request: R1103580
 Date Analyzed: 6/29/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 251815

Lab Control Sample
 RQ1106319-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	22.0	20.0	110	72 - 128
1,1,2,2-Tetrachloroethane	22.4	20.0	112	72 - 131
1,1,2-Trichloroethane	22.1	20.0	110	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	23.5	20.0	117	71 - 134
1,1-Dichloroethane (1,1-DCA)	23.8	20.0	119	76 - 122
1,1-Dichloroethene (1,1-DCE)	22.2	20.0	111	72 - 129
1,2,4-Trichlorobenzene	24.7	20.0	123	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	23.8	20.0	119	62 - 131
1,2-Dibromoethane	21.8	20.0	109	78 - 125
1,2-Dichlorobenzene	22.3	20.0	112	79 - 124
1,2-Dichloroethane	21.5	20.0	107	78 - 126
1,2-Dichloropropane	22.3	20.0	112	80 - 123
1,3-Dichlorobenzene	23.7	20.0	118	78 - 124
1,4-Dichlorobenzene	22.5	20.0	113	78 - 123
n-Butanol	1140	1000	114	70 - 130
2-Butanone (MEK)	23.0	20.0	115	60 - 133
2-Hexanone	21.6	20.0	108	61 - 131
4-Methyl-2-pentanone	22.2	20.0	111	61 - 132
Acetone	23.1	20.0	115	59 - 140
Benzene	23.2	20.0	116	78 - 121
Bromodichloromethane	23.0	20.0	115	80 - 125
Bromoform	23.6	20.0	118	73 - 132
Bromomethane	21.0	20.0	105	57 - 144
Carbon Disulfide	15.0	20.0	75	59 - 138
Carbon Tetrachloride	22.8	20.0	114	69 - 135
Chlorobenzene	23.5	20.0	118	80 - 121
Chloroethane	25.2	20.0	126	71 - 130
Chloroform	21.2	20.0	106	78 - 125
Chloromethane	24.7	20.0	124	62 - 133
Cyclohexane	17.2	20.0	86	67 - 127
Dibromochloromethane	22.4	20.0	112	78 - 133
Dichlorodifluoromethane (CFC 12)	26.5	20.0	132	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED/TR0272
Sample Matrix: Water

Service Request: R1103580
Date Analyzed: 6/29/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

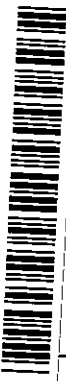
Analysis Lot: 251815

**Lab Control Sample
 RQ1106319-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	22.7	20.0	114	75 - 125
Ethylbenzene	23.4	20.0	117	78 - 123
Isopropylbenzene (Cumene)	26.8	20.0	134 *	73 - 133
Methyl Acetate	20.3	20.0	101	57 - 157
Methyl tert-Butyl Ether	21.4	20.0	107	75 - 126
Methylcyclohexane	17.7	20.0	89	64 - 133
Styrene	23.9	20.0	120	80 - 132
Tetrachloroethene (PCE)	24.2	20.0	121	72 - 131
Toluene	23.6	20.0	118	78 - 122
Trichloroethene (TCE)	22.9	20.0	114	74 - 127
Trichlorofluoromethane (CFC 11)	24.0	20.0	120	71 - 139
Vinyl Chloride	25.6	20.0	128	71 - 136
cis-1,2-Dichloroethene	23.1	20.0	115	78 - 122
cis-1,3-Dichloropropene	22.4	20.0	112	77 - 125
m,p-Xylenes	49.3	40.0	123	79 - 126
n-Butyl Acetate	21.9	20.0	110	54 - 127
o-Xylene	22.9	20.0	115	79 - 126
trans-1,2-Dichloroethene	22.6	20.0	113	75 - 121
trans-1,3-Dichloropropene	21.5	20.0	108	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Project Name LC34 PED		Project Number TR0272		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager Cory RPTA		Report CC		PRESERVATIVE	
Company/Address GEOSYNTEL (6061PH)				METALS, TOTAL (List in comments below)	
E-mail Cory RPTA @ geosyntel.com				METALS, DISSOLVED (List in comments below)	
Supplier's Printed Name JOSEPH BARBUS				PCBS <input type="checkbox"/> 8082 <input type="checkbox"/> 608	
FOR OFFICE USE ONLY		SAMPLING DATE		PESTICIDES <input type="checkbox"/> 8081 <input type="checkbox"/> 608	
CLIENT SAMPLE ID	LAB ID	DATE	TIME	GCMS VOAs <input type="checkbox"/> 8021 <input type="checkbox"/> 601/602	
BATCH 54 - 20110623-0750	-001	6/23/11	0750	GCMS SVOAs <input type="checkbox"/> 8270 <input type="checkbox"/> 625	
BATCH 57 - 20110623-1150	-002	6/23/11	1150	GCMS VOAs <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> CLP	
BATCH 67 - 20110623-1540	-003	6/23/11	1540	NUMBER OF CONTAINERS	
TEST BLANK	Hold 0	-	-	4	
				4	
				4	
				3	
SPECIAL INSTRUCTIONS/COMMENTS Metals		TURNAROUND REQUIREMENTS		REPORT REQUIREMENTS	
as per client email KSB6/28/11		RUSH (SURCHARGES APPLY)		I. Results Only	
		1 day <input type="checkbox"/> 2 day <input type="checkbox"/> 3 day <input type="checkbox"/>		II. Results + QC Summaries (LCS, DUP, MSMSD as required)	
		4 day <input type="checkbox"/> 5 day <input type="checkbox"/>		III. Results + QC and Calibration Summaries	
		<input checked="" type="checkbox"/> Standard		IV. Data Validation Report with Raw Data	
RECEIVED BY JOSEPH BARBUS		RECEIVED BY		PO #	
Signature JOSEPH BARBUS		Signature		BILL TO:	
Printed Name JOSEPH BARBUS		Printed Name			
Firm GEOSYNTEL CONSULTANTS		Firm			
Date/Time 6/24/11 1500		Date/Time			
RECEIVED BY JOSEPH BARBUS		RECEIVED BY		R1103580	
Signature JOSEPH BARBUS		Signature		GeoSyntec Consultants	
Printed Name JOSEPH BARBUS		Printed Name		LC34 PED	
Firm GEOSYNTEL CONSULTANTS		Firm			
Date/Time 6/24/11 1500		Date/Time			

Cooler Receipt And Preservation Check Form

Project/Client Geosyntec- FL Folder Number R11-3580

Cooler received on 6/25/11 by: DPW COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did ~~VOA~~ vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A*
5. Were ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.6

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 6/25/11 / 1126

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: ~~Temp Blank~~ Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB Jbed11

Cooler Breakdown: Date: 6/26/27/11 Time: 1021 by: DPW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 2. Did all bottle labels and tags agree with custody papers? YES NO
 3. Were correct containers used for the tests indicated? YES NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	
		YES	NO							
≥12	NaOH									Yes = All samples OK
≤2	HNO ₃								No = Samples were preserved at lab as listed	
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						PM OK to Adjust:
	Na ₂ S ₂ O ₃	-	-						*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet	
	Zn Aceta	-	-							
	HCl	*	*							

Bottle lot numbers: 0503 053011-2V, 0-519-005
 Other Comments: * 1 vial for the Trip Blank

July 28, 2011

Service Request No: R1103657

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 - PED TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on June 30, 2011. For your reference, these analyses have been assigned our service request number **R1103657**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 40

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1103657
Date Received: 6/30/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Seven (7) water samples were collected by the client on 6/27-28/11 and were received for analysis at Columbia Analytical Services on 6/30/11 via a national courier. The samples were received at a cooler temperature of 3.0°C within the guidelines of 0-6°C.

Volatile Organic Compounds

Seven (7) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for Carbon Disulfide (36.9) and Dichlorodifluoromethane (20.6) which were above the 20 %D on the 7/1/11 run and Dichlorodifluoromethane (25.7) on the 7/5/11 analytical run. Any hits for these compounds on associated runs would be considered estimated, however, all samples were non-detect for these compounds.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Hits above the calibration range of the standards are repeated at the appropriate dilution for the hit. The data is flagged as "D" on the report. The sample data is reported in a merged format to be consistent with other reports for this project at the client's request.

All samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination except for a 1,2,4-Trichlorobenzene hit in the 7/1/11 and 7/5/11 blanks. No data required "B" flags however.

No other analytical or QC problems were encountered.

Inorganic Parameters

Seven (7) water samples were analyzed for Bromide and four (4) samples were analyzed for Iodide by IC method 300.0.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

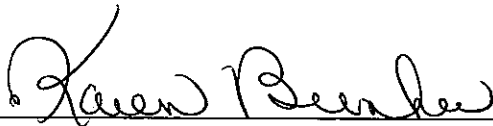
Approved by Karen S. Bunker Date 7/29/11

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date

7/29/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1103657

<u>Lab ID</u>	<u>Client ID</u>
R1103657-001	BATCH 112-20110627
R1103657-002	BATCH 117-20110627
R1103657-003	BATCH 127-20110627
R1103657-004	BATCH 134-20110627
R1103657-005	BATCH 136-20110628
R1103657-006	BATCH 144-20110628
R1103657-007	BATCH 152-20110628

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nebraska Accredited
Connecticut ID # PH0556	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
DoD ELAP #65817	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 112-20110627
Lab Code: R1103657-001

Service Request: R1103657
Date Collected: 6/27/11 1000
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	76.0	mg/L	2.0	20	NA	7/25/11 18:00	
Iodide	300.0	100	mg/L	20	100	NA	7/12/11 18:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: BATCH 112-20110627
 Lab Code: R1103657-001

Service Request: R1103657
 Date Collected: 6/27/11 1000
 Date Received: 6/30/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130000	U	130000	5800	25000	NA	7/1/11 18:20		252201	
1,1,2,2-Tetrachloroethane	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,1,2-Trichloroethane	130000	U	130000	5800	25000	NA	7/1/11 18:20		252201	
1,1,2-Trichloro-1,2,2-trifluoroethane	130000	U	130000	7800	25000	NA	7/1/11 18:20		252201	
1,1-Dichloroethane (1,1-DCA)	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,1-Dichloroethene (1,1-DCE)	130000	U	130000	7300	25000	NA	7/1/11 18:20		252201	
1,2,4-Trichlorobenzene	130000	U	130000	6500	25000	NA	7/1/11 18:20		252201	
1,2-Dibromo-3-chloropropane (DBCP)	130000	U	130000	9500	25000	NA	7/1/11 18:20		252201	
1,2-Dibromoethane	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,2-Dichlorobenzene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,2-Dichloroethane	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,2-Dichloropropane	130000	U	130000	7100	25000	NA	7/1/11 18:20		252201	
1,3-Dichlorobenzene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
1,4-Dichlorobenzene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
n-Butanol	1300000	U	1300000	270000	25000	NA	7/1/11 18:20		252201	
2-Butanone (MEK)	250000	U	250000	13000	25000	NA	7/1/11 18:20		252201	
2-Hexanone	250000	U	250000	8800	25000	NA	7/1/11 18:20		252201	
4-Methyl-2-pentanone	250000	U	250000	6800	25000	NA	7/1/11 18:20		252201	
Acetone	500000	U	500000	25000	25000	NA	7/1/11 18:20		252201	
Benzene	130000	U	130000	5300	25000	NA	7/1/11 18:20		252201	
Bromodichloromethane	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Bromoform	130000	U	130000	6800	25000	NA	7/1/11 18:20		252201	
Bromomethane	130000	U	130000	7800	25000	NA	7/1/11 18:20		252201	
Carbon Disulfide	250000	U	250000	5000	25000	NA	7/1/11 18:20		252201	
Carbon Tetrachloride	130000	U	130000	6800	25000	NA	7/1/11 18:20		252201	
Chlorobenzene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Chloroethane	130000	U	130000	7800	25000	NA	7/1/11 18:20		252201	
Chloroform	130000	U	130000	5500	25000	NA	7/1/11 18:20		252201	
Chloromethane	130000	U	130000	6000	25000	NA	7/1/11 18:20		252201	
Cyclohexane	250000	U	250000	6000	25000	NA	7/1/11 18:20		252201	
Dibromochloromethane	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Dichlorodifluoromethane (CFC 12)	130000	U	130000	15000	25000	NA	7/1/11 18:20		252201	
Dichloromethane	130000	U	130000	5500	25000	NA	7/1/11 18:20		252201	
Ethylbenzene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Isopropylbenzene (Cumene)	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Methyl Acetate	250000	U	250000	5800	25000	NA	7/1/11 18:20		252201	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 112-20110627
Lab Code: R1103657-001

Service Request: R1103657
Date Collected: 6/27/11 1000
Date Received: 6/30/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Methylcyclohexane	250000	U	250000	6300	25000	NA	7/1/11 18:20		252201	
Styrene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Tetrachloroethene (PCE)	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Toluene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Trichloroethene (TCE)	130000	U	130000	5800	25000	NA	7/1/11 18:20		252201	
Trichlorofluoromethane (CFC 11)	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
Vinyl Chloride	130000	U	130000	5800	25000	NA	7/1/11 18:20		252201	
cis-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
cis-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
m,p-Xylenes	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
n-Butyl Acetate	3800000		130000	5300	25000	NA	7/1/11 18:20		252201	
o-Xylene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
trans-1,2-Dichloroethene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	
trans-1,3-Dichloropropene	130000	U	130000	5000	25000	NA	7/1/11 18:20		252201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/1/11 18:20	
Dibromofluoromethane	107	89-119	7/1/11 18:20	
Toluene-d8	107	87-121	7/1/11 18:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 117-20110627
Lab Code: R1103657-002

Service Request: R1103657
Date Collected: 6/27/11 1110
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	69.4	mg/L	2.0	20	NA	7/25/11 19:09	
Iodide	300.0	145	mg/L	20	100	NA	7/12/11 19:01	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: BATCH 117-20110627
 Lab Code: R1103657-002

Service Request: R1103657
 Date Collected: 6/27/11 1110
 Date Received: 6/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	7/1/11 18:51		252201	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	7/1/11 18:51		252201	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	7/1/11 18:51		252201	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	7/1/11 18:51		252201	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	7/1/11 18:51		252201	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	7/1/11 18:51		252201	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	7/1/11 18:51		252201	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
n-Butanol	500000	U	500000	110000	10000	NA	7/1/11 18:51		252201	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	7/1/11 18:51		252201	
2-Hexanone	100000	U	100000	3500	10000	NA	7/1/11 18:51		252201	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	7/1/11 18:51		252201	
Acetone	200000	U	200000	9800	10000	NA	7/1/11 18:51		252201	
Benzene	50000	U	50000	2100	10000	NA	7/1/11 18:51		252201	
Bromodichloromethane	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Bromoform	50000	U	50000	2700	10000	NA	7/1/11 18:51		252201	
Bromomethane	50000	U	50000	3100	10000	NA	7/1/11 18:51		252201	
Carbon Disulfide	100000	U	100000	2000	10000	NA	7/1/11 18:51		252201	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	7/1/11 18:51		252201	
Chlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Chloroethane	50000	U	50000	3100	10000	NA	7/1/11 18:51		252201	
Chloroform	50000	U	50000	2200	10000	NA	7/1/11 18:51		252201	
Chloromethane	50000	U	50000	2400	10000	NA	7/1/11 18:51		252201	
Cyclohexane	100000	U	100000	2400	10000	NA	7/1/11 18:51		252201	
Dibromochloromethane	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	7/1/11 18:51		252201	
Dichloromethane	50000	U	50000	2200	10000	NA	7/1/11 18:51		252201	
Ethylbenzene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Methyl Acetate	100000	U	100000	2300	10000	NA	7/1/11 18:51		252201	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 117-20110627
Lab Code: R1103657-002

Service Request: R1103657
Date Collected: 6/27/11 1110
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Methylcyclohexane	100000	U	100000	2500	10000	NA	7/1/11 18:51		252201	
Styrene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Toluene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	7/1/11 18:51		252201	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
Vinyl Chloride	50000	U	50000	2300	10000	NA	7/1/11 18:51		252201	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
m,p-Xylenes	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
n-Butyl Acetate	1800000		50000	2100	10000	NA	7/1/11 18:51		252201	
o-Xylene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/1/11 18:51		252201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/1/11 18:51	
Dibromofluoromethane	107	89-119	7/1/11 18:51	
Toluene-d8	108	87-121	7/1/11 18:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 127-20110627
Lab Code: R1103657-003

Service Request: R1103657
Date Collected: 6/27/11 1315
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	68.0	mg/L	2.0	20	NA	7/25/11 19:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: BATCH 127-20110627
 Lab Code: R1103657-003

Service Request: R1103657
 Date Collected: 6/27/11 1315
 Date Received: 6/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	7/1/11 19:51		252201	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	7/1/11 19:51		252201	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	7/1/11 19:51		252201	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	7/1/11 19:51		252201	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	7/1/11 19:51		252201	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	7/1/11 19:51		252201	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	7/1/11 19:51		252201	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
n-Butanol	500000	U	500000	110000	10000	NA	7/1/11 19:51		252201	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	7/1/11 19:51		252201	
2-Hexanone	100000	U	100000	3500	10000	NA	7/1/11 19:51		252201	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	7/1/11 19:51		252201	
Acetone	200000	U	200000	9800	10000	NA	7/1/11 19:51		252201	
Benzene	50000	U	50000	2100	10000	NA	7/1/11 19:51		252201	
Bromodichloromethane	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Bromoform	50000	U	50000	2700	10000	NA	7/1/11 19:51		252201	
Bromomethane	50000	U	50000	3100	10000	NA	7/1/11 19:51		252201	
Carbon Disulfide	100000	U	100000	2000	10000	NA	7/1/11 19:51		252201	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	7/1/11 19:51		252201	
Chlorobenzene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Chloroethane	50000	U	50000	3100	10000	NA	7/1/11 19:51		252201	
Chloroform	50000	U	50000	2200	10000	NA	7/1/11 19:51		252201	
Chloromethane	50000	U	50000	2400	10000	NA	7/1/11 19:51		252201	
Cyclohexane	100000	U	100000	2400	10000	NA	7/1/11 19:51		252201	
Dibromochloromethane	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	7/1/11 19:51		252201	
Dichloromethane	50000	U	50000	2200	10000	NA	7/1/11 19:51		252201	
Ethylbenzene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Methyl Acetate	100000	U	100000	2300	10000	NA	7/1/11 19:51		252201	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 127-20110627
Lab Code: R1103657-003

Service Request: R1103657
Date Collected: 6/27/11 1315
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Methylcyclohexane	100000	U	100000	2500	10000	NA	7/1/11 19:51		252201	
Styrene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Toluene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	7/1/11 19:51		252201	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
Vinyl Chloride	50000	U	50000	2300	10000	NA	7/1/11 19:51		252201	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
m,p-Xylenes	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
n-Butyl Acetate	1100000		50000	2100	10000	NA	7/1/11 19:51		252201	
o-Xylene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/1/11 19:51		252201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/1/11 19:51	
Dibromofluoromethane	107	89-119	7/1/11 19:51	
Toluene-d8	108	87-121	7/1/11 19:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 134-20110627
Lab Code: R1103657-004

Service Request: R1103657
Date Collected: 6/27/11 1450
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	68.5	mg/L	2.0	20	NA	7/25/11 19:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: BATCH 134-20110627
 Lab Code: R1103657-004

Service Request: R1103657
 Date Collected: 6/27/11 1450
 Date Received: 6/30/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	7/1/11 19:21		252201	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	7/1/11 19:21		252201	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	7/1/11 19:21		252201	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	7/1/11 19:21		252201	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	7/1/11 19:21		252201	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	7/1/11 19:21		252201	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	7/1/11 19:21		252201	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
n-Butanol	1000000	U	1000000	210000	20000	NA	7/1/11 19:21		252201	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	7/1/11 19:21		252201	
2-Hexanone	200000	U	200000	7000	20000	NA	7/1/11 19:21		252201	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	7/1/11 19:21		252201	
Acetone	400000	U	400000	20000	20000	NA	7/1/11 19:21		252201	
Benzene	100000	U	100000	4200	20000	NA	7/1/11 19:21		252201	
Bromodichloromethane	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Bromoform	100000	U	100000	5400	20000	NA	7/1/11 19:21		252201	
Bromomethane	100000	U	100000	6200	20000	NA	7/1/11 19:21		252201	
Carbon Disulfide	200000	U	200000	4000	20000	NA	7/1/11 19:21		252201	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	7/1/11 19:21		252201	
Chlorobenzene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Chloroethane	100000	U	100000	6200	20000	NA	7/1/11 19:21		252201	
Chloroform	100000	U	100000	4400	20000	NA	7/1/11 19:21		252201	
Chloromethane	100000	U	100000	4800	20000	NA	7/1/11 19:21		252201	
Cyclohexane	200000	U	200000	4800	20000	NA	7/1/11 19:21		252201	
Dibromochloromethane	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	7/1/11 19:21		252201	
Dichloromethane	100000	U	100000	4400	20000	NA	7/1/11 19:21		252201	
Ethylbenzene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Methyl Acetate	200000	U	200000	4600	20000	NA	7/1/11 19:21		252201	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 134-20110627
Lab Code: R1103657-004

Service Request: R1103657
Date Collected: 6/27/11 1450
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Methylcyclohexane	200000	U	200000	5000	20000	NA	7/1/11 19:21		252201	
Styrene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Toluene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	7/1/11 19:21		252201	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
Vinyl Chloride	100000	U	100000	4600	20000	NA	7/1/11 19:21		252201	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
m,p-Xylenes	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
n-Butyl Acetate	2300000		100000	4200	20000	NA	7/1/11 19:21		252201	
o-Xylene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	7/1/11 19:21		252201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/1/11 19:21	
Dibromofluoromethane	107	89-119	7/1/11 19:21	
Toluene-d8	109	87-121	7/1/11 19:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 136-20110628
Lab Code: R1103657-005

Service Request: R1103657
Date Collected: 6/28/11 0900
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	63.4	mg/L	2.0	20	NA	7/25/11 19:50	
Iodide	300.0	105	mg/L	20	100	NA	7/12/11 19:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 136-20110628
Lab Code: R1103657-005

Service Request: R1103657
Date Collected: 6/28/11 0900
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	7/5/11 14:06		252203	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	7/5/11 14:06		252203	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	7/5/11 14:06		252203	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	7/5/11 14:06		252203	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	7/5/11 14:06		252203	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	7/5/11 14:06		252203	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	7/5/11 14:06		252203	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
n-Butanol	500000	U	500000	110000	10000	NA	7/5/11 14:06		252203	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	7/5/11 14:06		252203	
2-Hexanone	100000	U	100000	3500	10000	NA	7/5/11 14:06		252203	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	7/5/11 14:06		252203	
Acetone	200000	U	200000	9800	10000	NA	7/5/11 14:06		252203	
Benzene	50000	U	50000	2100	10000	NA	7/5/11 14:06		252203	
Bromodichloromethane	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Bromoform	50000	U	50000	2700	10000	NA	7/5/11 14:06		252203	
Bromomethane	50000	U	50000	3100	10000	NA	7/5/11 14:06		252203	
Carbon Disulfide	100000	U	100000	2000	10000	NA	7/5/11 14:06		252203	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	7/5/11 14:06		252203	
Chlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Chloroethane	50000	U	50000	3100	10000	NA	7/5/11 14:06		252203	
Chloroform	50000	U	50000	2200	10000	NA	7/5/11 14:06		252203	
Chloromethane	50000	U	50000	2400	10000	NA	7/5/11 14:06		252203	
Cyclohexane	100000	U	100000	2400	10000	NA	7/5/11 14:06		252203	
Dibromochloromethane	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	7/5/11 14:06		252203	
Dichloromethane	50000	U	50000	2200	10000	NA	7/5/11 14:06		252203	
Ethylbenzene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Methyl Acetate	100000	U	100000	2300	10000	NA	7/5/11 14:06		252203	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 136-20110628
Lab Code: R1103657-005

Service Request: R1103657
Date Collected: 6/28/11 0900
Date Received: 6/30/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Methylcyclohexane	100000	U	100000	2500	10000	NA	7/5/11 14:06		252203	
Styrene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Toluene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	7/5/11 14:06		252203	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
Vinyl Chloride	50000	U	50000	2300	10000	NA	7/5/11 14:06		252203	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
m,p-Xylenes	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
n-Butyl Acetate	2500000	D	100000	4200	20000	NA	7/5/11 15:50		252203	
o-Xylene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/5/11 14:06		252203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/5/11 14:06	
Dibromofluoromethane	109	89-119	7/5/11 14:06	
Toluene-d8	108	87-121	7/5/11 14:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 144-20110628
Lab Code: R1103657-006

Service Request: R1103657
Date Collected: 6/28/11 1040
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	16.8	mg/L	1.0	10	NA	7/6/11 05:36	
Iodide	300.0	27	mg/L	20	100	NA	7/12/11 19:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 144-20110628
Lab Code: R1103657-006

Service Request: R1103657
Date Collected: 6/28/11 1040
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	7/5/11 16:21		252203	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	7/5/11 16:21		252203	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	7/5/11 16:21		252203	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	7/5/11 16:21		252203	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	7/5/11 16:21		252203	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	7/5/11 16:21		252203	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	7/5/11 16:21		252203	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
n-Butanol	500000	U	500000	110000	10000	NA	7/5/11 16:21		252203	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	7/5/11 16:21		252203	
2-Hexanone	100000	U	100000	3500	10000	NA	7/5/11 16:21		252203	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	7/5/11 16:21		252203	
Acetone	200000	U	200000	9800	10000	NA	7/5/11 16:21		252203	
Benzene	50000	U	50000	2100	10000	NA	7/5/11 16:21		252203	
Bromodichloromethane	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Bromoform	50000	U	50000	2700	10000	NA	7/5/11 16:21		252203	
Bromomethane	50000	U	50000	3100	10000	NA	7/5/11 16:21		252203	
Carbon Disulfide	100000	U	100000	2000	10000	NA	7/5/11 16:21		252203	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	7/5/11 16:21		252203	
Chlorobenzene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Chloroethane	50000	U	50000	3100	10000	NA	7/5/11 16:21		252203	
Chloroform	50000	U	50000	2200	10000	NA	7/5/11 16:21		252203	
Chloromethane	50000	U	50000	2400	10000	NA	7/5/11 16:21		252203	
Cyclohexane	100000	U	100000	2400	10000	NA	7/5/11 16:21		252203	
Dibromochloromethane	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	7/5/11 16:21		252203	
Dichloromethane	50000	U	50000	2200	10000	NA	7/5/11 16:21		252203	
Ethylbenzene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Methyl Acetate	100000	U	100000	2300	10000	NA	7/5/11 16:21		252203	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 144-20110628
Lab Code: R1103657-006

Service Request: R1103657
Date Collected: 6/28/11 1040
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Methylcyclohexane	100000	U	100000	2500	10000	NA	7/5/11 16:21		252203	
Styrene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Toluene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Trichloroethene (TCE)	50000	U	50000	2300	10000	NA	7/5/11 16:21		252203	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
Vinyl Chloride	50000	U	50000	2300	10000	NA	7/5/11 16:21		252203	
cis-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
m,p-Xylenes	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
n-Butyl Acetate	1800000		50000	2100	10000	NA	7/5/11 16:21		252203	
o-Xylene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/5/11 16:21		252203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	7/5/11 16:21	
Dibromofluoromethane	105	89-119	7/5/11 16:21	
Toluene-d8	107	87-121	7/5/11 16:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 152-20110628
Lab Code: R1103657-007

Service Request: R1103657
Date Collected: 6/28/11 1237
Date Received: 6/30/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	64.2	mg/L	2.0	20	NA	7/25/11 20:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 152-20110628
Lab Code: R1103657-007

Service Request: R1103657
Date Collected: 6/28/11 1237
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100000	U	100000	4600	20000	NA	7/5/11 15:20		252203	
1,1,2,2-Tetrachloroethane	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,1,2-Trichloroethane	100000	U	100000	4600	20000	NA	7/5/11 15:20		252203	
1,1,2-Trichloro-1,2,2-trifluoroethane	100000	U	100000	6200	20000	NA	7/5/11 15:20		252203	
1,1-Dichloroethane (1,1-DCA)	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,1-Dichloroethene (1,1-DCE)	100000	U	100000	5800	20000	NA	7/5/11 15:20		252203	
1,2,4-Trichlorobenzene	100000	U	100000	5200	20000	NA	7/5/11 15:20		252203	
1,2-Dibromo-3-chloropropane (DBCP)	100000	U	100000	7600	20000	NA	7/5/11 15:20		252203	
1,2-Dibromoethane	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,2-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,2-Dichloroethane	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,2-Dichloropropane	100000	U	100000	5700	20000	NA	7/5/11 15:20		252203	
1,3-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
1,4-Dichlorobenzene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
n-Butanol	1000000	U	1000000	210000	20000	NA	7/5/11 15:20		252203	
2-Butanone (MEK)	200000	U	200000	11000	20000	NA	7/5/11 15:20		252203	
2-Hexanone	200000	U	200000	7000	20000	NA	7/5/11 15:20		252203	
4-Methyl-2-pentanone	200000	U	200000	5400	20000	NA	7/5/11 15:20		252203	
Acetone	400000	U	400000	20000	20000	NA	7/5/11 15:20		252203	
Benzene	100000	U	100000	4200	20000	NA	7/5/11 15:20		252203	
Bromodichloromethane	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Bromoform	100000	U	100000	5400	20000	NA	7/5/11 15:20		252203	
Bromomethane	100000	U	100000	6200	20000	NA	7/5/11 15:20		252203	
Carbon Disulfide	200000	U	200000	4000	20000	NA	7/5/11 15:20		252203	
Carbon Tetrachloride	100000	U	100000	5400	20000	NA	7/5/11 15:20		252203	
Chlorobenzene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Chloroethane	100000	U	100000	6200	20000	NA	7/5/11 15:20		252203	
Chloroform	100000	U	100000	4400	20000	NA	7/5/11 15:20		252203	
Chloromethane	100000	U	100000	4800	20000	NA	7/5/11 15:20		252203	
Cyclohexane	200000	U	200000	4800	20000	NA	7/5/11 15:20		252203	
Dibromochloromethane	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Dichlorodifluoromethane (CFC 12)	100000	U	100000	12000	20000	NA	7/5/11 15:20		252203	
Dichloromethane	100000	U	100000	4400	20000	NA	7/5/11 15:20		252203	
Ethylbenzene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Isopropylbenzene (Cumene)	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Methyl Acetate	200000	U	200000	4600	20000	NA	7/5/11 15:20		252203	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: BATCH 152-20110628
Lab Code: R1103657-007

Service Request: R1103657
Date Collected: 6/28/11 1237
Date Received: 6/30/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Methylcyclohexane	200000	U	200000	5000	20000	NA	7/5/11 15:20		252203	
Styrene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Tetrachloroethene (PCE)	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Toluene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Trichloroethene (TCE)	100000	U	100000	4600	20000	NA	7/5/11 15:20		252203	
Trichlorofluoromethane (CFC 11)	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
Vinyl Chloride	100000	U	100000	4600	20000	NA	7/5/11 15:20		252203	
cis-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
cis-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
m,p-Xylenes	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
n-Butyl Acetate	2100000		100000	4200	20000	NA	7/5/11 15:20		252203	
o-Xylene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
trans-1,2-Dichloroethene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	
trans-1,3-Dichloropropene	100000	U	100000	4000	20000	NA	7/5/11 15:20		252203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	7/5/11 15:20	
Dibromofluoromethane	105	89-119	7/5/11 15:20	
Toluene-d8	108	87-121	7/5/11 15:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103657-MB1

Service Request: R1103657
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	7/6/11 01:34	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	7/12/11 17:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103657-MB2

Service Request: R1103657
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U mg/L	0.10	1	NA	7/25/11 15:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106449-04

Service Request: R1103657
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/1/11 12:12		252201	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/1/11 12:12		252201	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/1/11 12:12		252201	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/1/11 12:12		252201	
1,2,4-Trichlorobenzene	0.30	J	5.0	0.26	1	NA	7/1/11 12:12		252201	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/1/11 12:12		252201	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/1/11 12:12		252201	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
n-Butanol	50	U	50	11	1	NA	7/1/11 12:12		252201	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/1/11 12:12		252201	
2-Hexanone	10	U	10	0.35	1	NA	7/1/11 12:12		252201	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/1/11 12:12		252201	
Acetone	20	U	20	0.98	1	NA	7/1/11 12:12		252201	
Benzene	5.0	U	5.0	0.21	1	NA	7/1/11 12:12		252201	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Bromoform	5.0	U	5.0	0.27	1	NA	7/1/11 12:12		252201	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/1/11 12:12		252201	
Carbon Disulfide	10	U	10	0.20	1	NA	7/1/11 12:12		252201	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/1/11 12:12		252201	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/1/11 12:12		252201	
Chloroform	5.0	U	5.0	0.22	1	NA	7/1/11 12:12		252201	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/1/11 12:12		252201	
Cyclohexane	10	U	10	0.24	1	NA	7/1/11 12:12		252201	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/1/11 12:12		252201	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/1/11 12:12		252201	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Methyl Acetate	10	U	10	0.23	1	NA	7/1/11 12:12		252201	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106449-04

Service Request: R1103657
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252201

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Methylcyclohexane	10	U	10	0.25	1	NA	7/1/11 12:12		252201	
Styrene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Toluene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/1/11 12:12		252201	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/1/11 12:12		252201	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/1/11 12:12		252201	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/1/11 12:12		252201	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/1/11 12:12	
Dibromofluoromethane	106	89-119	7/1/11 12:12	
Toluene-d8	107	87-121	7/1/11 12:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106506-04

Service Request: R1103657
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/5/11 13:36		252203	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/5/11 13:36		252203	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/5/11 13:36		252203	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/5/11 13:36		252203	
1,2,4-Trichlorobenzene	0.34	J	5.0	0.26	1	NA	7/5/11 13:36		252203	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/5/11 13:36		252203	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/5/11 13:36		252203	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
n-Butanol	50	U	50	11	1	NA	7/5/11 13:36		252203	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/5/11 13:36		252203	
2-Hexanone	10	U	10	0.35	1	NA	7/5/11 13:36		252203	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/5/11 13:36		252203	
Acetone	20	U	20	0.98	1	NA	7/5/11 13:36		252203	
Benzene	5.0	U	5.0	0.21	1	NA	7/5/11 13:36		252203	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Bromoform	5.0	U	5.0	0.27	1	NA	7/5/11 13:36		252203	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/5/11 13:36		252203	
Carbon Disulfide	10	U	10	0.20	1	NA	7/5/11 13:36		252203	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/5/11 13:36		252203	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/5/11 13:36		252203	
Chloroform	5.0	U	5.0	0.22	1	NA	7/5/11 13:36		252203	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/5/11 13:36		252203	
Cyclohexane	10	U	10	0.24	1	NA	7/5/11 13:36		252203	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/5/11 13:36		252203	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/5/11 13:36		252203	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Methyl Acetate	10	U	10	0.23	1	NA	7/5/11 13:36		252203	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106506-04

Service Request: R1103657
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252203

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Methylcyclohexane	10	U	10	0.25	1	NA	7/5/11 13:36		252203	
Styrene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Toluene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/5/11 13:36		252203	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/5/11 13:36		252203	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/5/11 13:36		252203	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/5/11 13:36		252203	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/5/11 13:36	
Dibromofluoromethane	108	89-119	7/5/11 13:36	
Toluene-d8	109	87-121	7/5/11 13:36	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water

Service Request: R1103657
Date Analyzed: 7/6/11 -
7/12/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R1103657-LCS1

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Bromide	300.0	1.05	1.00	105	90 - 110	
Iodide	300.0	0.958	1.00	96	90 - 110	

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water

Service Request: R1103657
Date Analyzed: 7/25/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1103657-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.07	1.00	107	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water

Service Request: R1103657
Date Analyzed: 7/ 1/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 252201

**Lab Control Sample
 RQ1106449-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.4	20.0	82	72 - 128
1,1,2,2-Tetrachloroethane	21.4	20.0	107	72 - 131
1,1,2-Trichloroethane	22.5	20.0	112	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.6	20.0	83	71 - 134
1,1-Dichloroethane (1,1-DCA)	19.0	20.0	95	76 - 122
1,1-Dichloroethene (1,1-DCE)	16.8	20.0	84	72 - 129
1,2,4-Trichlorobenzene	21.1	20.0	105	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	22.6	20.0	113	62 - 131
1,2-Dibromoethane	21.1	20.0	106	78 - 125
1,2-Dichlorobenzene	20.2	20.0	101	79 - 124
1,2-Dichloroethane	20.3	20.0	102	78 - 126
1,2-Dichloropropane	19.4	20.0	97	80 - 123
1,3-Dichlorobenzene	19.7	20.0	98	78 - 124
1,4-Dichlorobenzene	19.8	20.0	99	78 - 123
n-Butanol	1170	1000	117	70 - 130
2-Butanone (MEK)	22.3	20.0	111	60 - 133
2-Hexanone	21.1	20.0	105	61 - 131
4-Methyl-2-pentanone	21.9	20.0	109	61 - 132
Acetone	22.7	20.0	114	59 - 140
Benzene	19.1	20.0	96	78 - 121
Bromodichloromethane	20.4	20.0	102	80 - 125
Bromoform	22.6	20.0	113	73 - 132
Bromomethane	19.8	20.0	99	57 - 144
Carbon Disulfide	18.9	20.0	95	59 - 138
Carbon Tetrachloride	17.0	20.0	85	69 - 135
Chlorobenzene	19.5	20.0	97	80 - 121
Chloroethane	19.6	20.0	98	71 - 130
Chloroform	17.7	20.0	89	78 - 125
Chloromethane	19.9	20.0	99	62 - 133
Cyclohexane	18.7	20.0	94	67 - 127
Dibromochloromethane	21.8	20.0	109	78 - 133
Dichlorodifluoromethane (CFC 12)	18.7	20.0	93	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water

Service Request: R1103657
Date Analyzed: 7/ 1/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 252201

**Lab Control Sample
 RQ1106449-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.9	20.0	100	75 - 125
Ethylbenzene	18.1	20.0	90	78 - 123
Isopropylbenzene (Cumene)	20.7	20.0	103	73 - 133
Methyl Acetate	20.6	20.0	103	57 - 157
Methyl tert-Butyl Ether	20.9	20.0	104	75 - 126
Methylcyclohexane	18.9	20.0	95	64 - 133
Styrene	19.8	20.0	99	80 - 132
Tetrachloroethene (PCE)	18.1	20.0	91	72 - 131
Toluene	19.1	20.0	96	78 - 122
Trichloroethene (TCE)	18.4	20.0	92	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	71 - 139
Vinyl Chloride	19.5	20.0	97	71 - 136
cis-1,2-Dichloroethene	19.5	20.0	97	78 - 122
cis-1,3-Dichloropropene	20.2	20.0	101	77 - 125
m,p-Xylenes	38.5	40.0	96	79 - 126
n-Butyl Acetate	20.6	20.0	103	54 - 127
o-Xylene	18.9	20.0	94	79 - 126
trans-1,2-Dichloroethene	18.1	20.0	90	75 - 121
trans-1,3-Dichloropropene	20.6	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 - PED TR0272
 Sample Matrix: Water

Service Request: R1103657
 Date Analyzed: 7/ 5/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 252203

Lab Control Sample
 RQ1106506-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	14.8	20.0	74	72 - 128
1,1,2,2-Tetrachloroethane	20.3	20.0	101	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.6	20.0	78	71 - 134
1,1-Dichloroethane (1,1-DCA)	17.9	20.0	89	76 - 122
1,1-Dichloroethene (1,1-DCE)	14.9	20.0	74	72 - 129
1,2,4-Trichlorobenzene	19.4	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.8	20.0	109	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	19.1	20.0	96	79 - 124
1,2-Dichloroethane	18.3	20.0	92	78 - 126
1,2-Dichloropropane	18.2	20.0	91	80 - 123
1,3-Dichlorobenzene	18.9	20.0	94	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	986	1000	99	70 - 130
2-Butanone (MEK)	22.0	20.0	110	60 - 133
2-Hexanone	18.9	20.0	95	61 - 131
4-Methyl-2-pentanone	20.2	20.0	101	61 - 132
Acetone	21.2	20.0	106	59 - 140
Benzene	17.5	20.0	87	78 - 121
Bromodichloromethane	18.5	20.0	92	80 - 125
Bromoform	22.0	20.0	110	73 - 132
Bromomethane	15.7	20.0	78	57 - 144
Carbon Disulfide	14.8	20.0	74	59 - 138
Carbon Tetrachloride	14.8	20.0	74	69 - 135
Chlorobenzene	18.3	20.0	91	80 - 121
Chloroethane	17.3	20.0	87	71 - 130
Chloroform	16.7	20.0	84	78 - 125
Chloromethane	17.7	20.0	88	62 - 133
Cyclohexane	16.0	20.0	80	67 - 127
Dibromochloromethane	19.8	20.0	99	78 - 133
Dichlorodifluoromethane (CFC 12)	16.6	20.0	83	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 - PED TR0272
Sample Matrix: Water

Service Request: R1103657
Date Analyzed: 7/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 252203

**Lab Control Sample
 RQ1106506-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.5	20.0	92	75 - 125
Ethylbenzene	16.5	20.0	82	78 - 123
Isopropylbenzene (Cumene)	19.2	20.0	96	73 - 133
Methyl Acetate	19.6	20.0	98	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	16.5	20.0	83	64 - 133
Styrene	18.7	20.0	93	80 - 132
Tetrachloroethene (PCE)	16.1	20.0	80	72 - 131
Toluene	17.4	20.0	87	78 - 122
Trichloroethene (TCE)	16.8	20.0	84	74 - 127
Trichlorofluoromethane (CFC 11)	15.6	20.0	78	71 - 139
Vinyl Chloride	17.1	20.0	85	71 - 136
cis-1,2-Dichloroethene	17.9	20.0	90	78 - 122
cis-1,3-Dichloropropene	18.7	20.0	94	77 - 125
m,p-Xylenes	36.1	40.0	90	79 - 126
n-Butyl Acetate	18.9	20.0	95	54 - 127
o-Xylene	17.6	20.0	88	79 - 126
trans-1,2-Dichloroethene	16.3	20.0	82	75 - 121
trans-1,3-Dichloropropene	19.0	20.0	95	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1 Mustard Street, Suite 250, Rochester, NY 14609 | 585.288.5380 | 800.695.7222 | 585.288.8475 (fax) PAGE 1 OF 1

Project Name LC34 - P60		Project Number TR0272		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager Copy REPTA		Report CC			
Company/Address GEOSYNTEL (GUELPH)					
Phone #		E-mail crepta@geosyntec.com		PRESERVATIVE	
Sampler's Signature <i>[Signature]</i>		Sampler's Printed Name Josaph BARTICH		NUMBER OF CONTAINERS	
CLIENT SAMPLE ID		FOR OFFICE USE ONLY LAB ID		MATRIX	
BATCH 112 - 20110627	001	6/27/11	1000	W	4
BATCH 117 - 20110627	002	6/27/11	1110	W	4
BATCH 127 - 20110627	003	6/27/11	1315	W	4
BATCH 124 - 20110627	004	6/27/11	1450	W	4
BATCH 136 - 20110628	005	6/28/11	0900	W	4
BATCH 144 - 20110628	006	6/28/11	1040	W	4
BATCH 152 - 20110628	007	6/28/11	1237	W	4
SPECIAL INSTRUCTIONS/COMMENTS Metals					
TURNAROUND REQUIREMENTS RUSH (SURCHARGES APPLY) 1 day 2 day 3 day 4 day 5 day <input checked="" type="checkbox"/> Standard		REPORT REQUIREMENTS I. Results Only II. Results + QC Summaries (LCS, DUP, MS/MSD as required) III. Results + QC and Calibration Summaries IV. Data Validation Report with Edata <input checked="" type="checkbox"/> Yes		INVOICE INFORMATION PO #: BILL TO:	
REQUESTED REPORT DATE		RECEIVED BY Signature: <i>[Signature]</i> Printed Name: B. Bartich Firm: Geosyntec Date/Time: 6/29/11		RECEIVED BY Signature: <i>[Signature]</i> Printed Name: B. Bartich Firm: Geosyntec Date/Time: 6/29/11 09:33	
See OAPP <input type="checkbox"/>		STATE WHERE SAMPLES WERE COLLECTED: FL		RECEIVED BY Signature: <i>[Signature]</i> Printed Name: B. Bartich Firm: Geosyntec Date/Time: 6/29/11	

- Preservative Key
- NONE
 - HCL
 - HNO3
 - H2SO4
 - NaOH
 - Zn Acetate
 - MeOH
 - NaHSO4
 - Other **LC34**

REMARKS/
ALTERNATE DESCRIPTION

METALS, TOTAL (List in comments below)
METALS, DISSOLVED (List in comments below)
PCBS 8082 608
PESTICIDES 8081 608
GC VOAS 8021 601/602
GC/MS SVOAS 8270 625
GC/MS VOAS 8260 624 CLP

R1103657
GeoSyntec Consultants
LC34 - PED TR0272



Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R110365.7 ^{3D b3d11}

Cooler received on 6/30/11 by: B COURIER: CAS UPS FEDEX ~~VELOCITY~~ CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A *
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.0°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 6/30 @ 0941

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 6/30/11

Cooler Breakdown: Date: 6/30/11 Time: 1143 by: AKH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust:

Bottle lot numbers: 0-319-005, 053011-2V

Other Comments: 1 vial for loc. BATCH 127-20110627

PC Secondary Review: KB 7/29/11

*significant air bubbles: VOA > 5-6 mm : WC > 1-in diameter

July 25, 2011

Service Request No: R1103705

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34-PED TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on July 2, 2011. For your reference, these analyses have been assigned our service request number **R1103705**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 134. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 54

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1103705
Date Received: 7/1/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Eighteen (18) water samples were collected by the client on 6/30/11 and were received for analysis at Columbia Analytical Services on 7/1/11 via a national courier. Some samples/analyses were placed on hold as per instructions on a table included in an email from the client: LC34-DPT328-051.0-20110630 (R1103705-004) VOC's only, LC34-DPT329-030.0-20110630 (R1103705-005) all analytes, LC34-DPT329-045.0-20110630 (R1103705-007) VOC's only, LC34-DPT329-051.0-20110630 (R1103705-008) all parameters, LC34-DPT330-010.0-20110630 (R1103705-009), LC34-DPT330-030.0-20110630 (R1103705-010) all parameters, LC34-DPT331-016.0-20110630 (R1103705-014) Iodide and VOC's, and LC34-DPT331-030.0-20110630 (R1103705-015) VOC's only. A revised Chain of custody was also sent via email to add sample LC34-DPT328-057.0-20110630 (R1103705-018). All chains are included in the report. The samples were received at a cooler temperature of 2.1°C within the guidelines of 0-6°C.

Volatile Organic Compounds

Nine (9) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except the following: The CCV standard exceeded 20% Difference criteria for 1,2-Dichloroethane, 1,1,2,2-Tetrachloroethane, and 1,2-Dibromo,3-chloropropane were not met in the CCV from 7/6/11. The compounds 1,1,2,2-Tetrachloroethane and 1,2-Dibromo,3-chloropropane were not met in the CCV from 7/7/11. All detected concentrations for this compound in samples associated with this CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

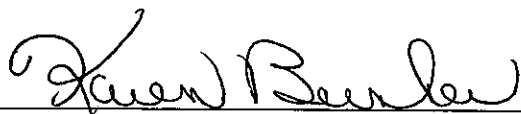
Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date

7/26/11

Inorganic Parameters

Fourteen (14) water samples were analyzed for Bromide and thirteen (13) samples were analyzed for Iodide by IC method 300.0.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met for these analyses.

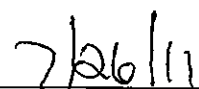
All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1103705

<u>Lab ID</u>	<u>Client ID</u>
R1103705-001	LC34-DPT328-030.0-20110630
R1103705-002	LC34-DPT328-039.0-20110630
R1103705-003	LC34-DPT328-045.0-20110630
R1103705-004	LC34-DPT328-051.0-20110630
R1103705-006	LC34-DPT329-039.0-20110630
R1103705-007	LC34-DPT329-045.0-20110630
R1103705-011	LC34-DPT330-039.0-20110630
R1103705-012	LC34-DPT330-045.0-20110630
R1103705-013	LC34-DPT330-051.0-20110630
R1103705-014	LC34-DPT331-016.0-20110630
R1103705-015	LC34-DPT331-030.0-20110630
R1103705-016	LC34-DPT331-039.0-20110630
R1103705-017	LC34-DPT331-045.0-20110630
R1103705-018	LC34-DPT328-057.0-20110630

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-030.0-20110630
Lab Code: R1103705-001

Service Request: R1103705
Date Collected: 6/30/11 0736
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	7/6/11 06:04	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 22:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT328-030.0-20110630
 Lab Code: R1103705-001

Service Request: R1103705
 Date Collected: 6/30/11 0736
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	7/6/11 22:26		252541	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	7/6/11 22:26		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	160	500	NA	7/6/11 22:26		252541	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	7/6/11 22:26		252541	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	7/6/11 22:26		252541	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	7/6/11 22:26		252541	
1,2-Dibromoethane	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,2-Dichloroethane	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,2-Dichloropropane	2500	U	2500	140	500	NA	7/6/11 22:26		252541	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
n-Butanol	25000	U	25000		500	NA	7/6/11 22:26		252541	
2-Butanone (MEK)	5000	U	5000	260	500	NA	7/6/11 22:26		252541	
2-Hexanone	5000	U	5000	180	500	NA	7/6/11 22:26		252541	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	7/6/11 22:26		252541	
Acetone	10000	U	10000	490	500	NA	7/6/11 22:26		252541	
Benzene	2500	U	2500	110	500	NA	7/6/11 22:26		252541	
Bromodichloromethane	170	J	2500	100	500	NA	7/6/11 22:26		252541	
Bromoform	2500	U	2500	140	500	NA	7/6/11 22:26		252541	
Bromomethane	2500	U	2500	160	500	NA	7/6/11 22:26		252541	
Carbon Disulfide	5000	U	5000	100	500	NA	7/6/11 22:26		252541	
Carbon Tetrachloride	2500	U	2500	140	500	NA	7/6/11 22:26		252541	
Chlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Chloroethane	2500	U	2500	160	500	NA	7/6/11 22:26		252541	
Chloroform	780	J	2500	110	500	NA	7/6/11 22:26		252541	
Chloromethane	2500	U	2500	120	500	NA	7/6/11 22:26		252541	
Cyclohexane	5000	U	5000	120	500	NA	7/6/11 22:26		252541	
Dibromochloromethane	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	7/6/11 22:26		252541	
Dichloromethane	2500	U	2500	110	500	NA	7/6/11 22:26		252541	
Ethylbenzene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Methyl Acetate	5000	U	5000	120	500	NA	7/6/11 22:26		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-030.0-20110630
Lab Code: R1103705-001

Service Request: R1103705
Date Collected: 6/30/11 0736
Date Received: 7/ 2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Methylcyclohexane	5000	U	5000	130	500	NA	7/6/11 22:26		252541	
Styrene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Toluene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Trichloroethene (TCE)	3800		2500	120	500	NA	7/6/11 22:26		252541	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
Vinyl Chloride	250	J	2500	120	500	NA	7/6/11 22:26		252541	
cis-1,2-Dichloroethene	48000		2500	100	500	NA	7/6/11 22:26		252541	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
m,p-Xylenes	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
n-Butyl Acetate	2500	U	2500	110	500	NA	7/6/11 22:26		252541	
o-Xylene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	
trans-1,2-Dichloroethene	440	J	2500	100	500	NA	7/6/11 22:26		252541	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/6/11 22:26		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	7/6/11 22:26	
Dibromofluoromethane	107	89-119	7/6/11 22:26	
Toluene-d8	94	87-121	7/6/11 22:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-039.0-20110630
Lab Code: R1103705-002

Service Request: R1103705
Date Collected: 6/30/11 0753
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.0	mg/L	1.0	10	NA	7/6/11 11:41	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 22:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-039.0-20110630
Lab Code: R1103705-002

Service Request: R1103705
Date Collected: 6/30/11 0753
Date Received: 7/ 2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	7/6/11 22:53		252541	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	7/6/11 22:53		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	160	500	NA	7/6/11 22:53		252541	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	7/6/11 22:53		252541	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	7/6/11 22:53		252541	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	7/6/11 22:53		252541	
1,2-Dibromoethane	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,2-Dichloroethane	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,2-Dichloropropane	2500	U	2500	140	500	NA	7/6/11 22:53		252541	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
n-Butanol	25000	U	25000		500	NA	7/6/11 22:53		252541	
2-Butanone (MEK)	5000	U	5000	260	500	NA	7/6/11 22:53		252541	
2-Hexanone	5000	U	5000	180	500	NA	7/6/11 22:53		252541	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	7/6/11 22:53		252541	
Acetone	10000	U	10000	490	500	NA	7/6/11 22:53		252541	
Benzene	2500	U	2500	110	500	NA	7/6/11 22:53		252541	
Bromodichloromethane	150	J	2500	100	500	NA	7/6/11 22:53		252541	
Bromoform	2500	U	2500	140	500	NA	7/6/11 22:53		252541	
Bromomethane	2500	U	2500	160	500	NA	7/6/11 22:53		252541	
Carbon Disulfide	5000	U	5000	100	500	NA	7/6/11 22:53		252541	
Carbon Tetrachloride	2500	U	2500	140	500	NA	7/6/11 22:53		252541	
Chlorobenzene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Chloroethane	2500	U	2500	160	500	NA	7/6/11 22:53		252541	
Chloroform	750	J	2500	110	500	NA	7/6/11 22:53		252541	
Chloromethane	2500	U	2500	120	500	NA	7/6/11 22:53		252541	
Cyclohexane	5000	U	5000	120	500	NA	7/6/11 22:53		252541	
Dibromochloromethane	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	7/6/11 22:53		252541	
Dichloromethane	2500	U	2500	110	500	NA	7/6/11 22:53		252541	
Ethylbenzene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Methyl Acetate	5000	U	5000	120	500	NA	7/6/11 22:53		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-039.0-20110630
Lab Code: R1103705-002

Service Request: R1103705
Date Collected: 6/30/11 0753
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Methylcyclohexane	5000	U	5000	130	500	NA	7/6/11 22:53		252541	
Styrene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Toluene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Trichloroethene (TCE)	1200	J	2500	120	500	NA	7/6/11 22:53		252541	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
Vinyl Chloride	2000	J	2500	120	500	NA	7/6/11 22:53		252541	
cis-1,2-Dichloroethene	56000		2500	100	500	NA	7/6/11 22:53		252541	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
m,p-Xylenes	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
n-Butyl Acetate	15000		2500	110	500	NA	7/6/11 22:53		252541	
o-Xylene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	
trans-1,2-Dichloroethene	260	J	2500	100	500	NA	7/6/11 22:53		252541	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/6/11 22:53		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	7/6/11 22:53	
Dibromofluoromethane	108	89-119	7/6/11 22:53	
Toluene-d8	93	87-121	7/6/11 22:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-045.0-20110630
Lab Code: R1103705-003

Service Request: R1103705
Date Collected: 6/30/11 0810
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.9	mg/L	1.0	10	NA	7/6/11 09:18	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 22:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT328-045.0-20110630
 Lab Code: R1103705-003

Service Request: R1103705
 Date Collected: 6/30/11 0810
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	7/6/11 23:20		252541	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	7/6/11 23:20		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	78	250	NA	7/6/11 23:20		252541	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	7/6/11 23:20		252541	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	7/6/11 23:20		252541	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	7/6/11 23:20		252541	
1,2-Dibromoethane	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,2-Dichloroethane	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,2-Dichloropropane	1300	U	1300	70	250	NA	7/6/11 23:20		252541	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
n-Butanol	13000	U	13000		250	NA	7/6/11 23:20		252541	
2-Butanone (MEK)	2500	U	2500	130	250	NA	7/6/11 23:20		252541	
2-Hexanone	2500	U	2500	88	250	NA	7/6/11 23:20		252541	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	7/6/11 23:20		252541	
Acetone	5000	U	5000	250	250	NA	7/6/11 23:20		252541	
Benzene	1300	U	1300	53	250	NA	7/6/11 23:20		252541	
Bromodichloromethane	100	J	1300	50	250	NA	7/6/11 23:20		252541	
Bromoform	1300	U	1300	68	250	NA	7/6/11 23:20		252541	
Bromomethane	1300	U	1300	78	250	NA	7/6/11 23:20		252541	
Carbon Disulfide	2500	U	2500	50	250	NA	7/6/11 23:20		252541	
Carbon Tetrachloride	1300	U	1300	68	250	NA	7/6/11 23:20		252541	
Chlorobenzene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Chloroethane	1300	U	1300	78	250	NA	7/6/11 23:20		252541	
Chloroform	410	J	1300	55	250	NA	7/6/11 23:20		252541	
Chloromethane	1300	U	1300	60	250	NA	7/6/11 23:20		252541	
Cyclohexane	2500	U	2500	60	250	NA	7/6/11 23:20		252541	
Dibromochloromethane	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	7/6/11 23:20		252541	
Dichloromethane	1300	U	1300	55	250	NA	7/6/11 23:20		252541	
Ethylbenzene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Methyl Acetate	2500	U	2500	58	250	NA	7/6/11 23:20		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-045.0-20110630
Lab Code: R1103705-003

Service Request: R1103705
Date Collected: 6/30/11 0810
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Methylcyclohexane	2500	U	2500	63	250	NA	7/6/11 23:20		252541	
Styrene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Toluene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
Trichloroethene (TCE)	1900		1300	58	250	NA	7/6/11 23:20		252541	
Trichlorofluoromethane (CFC 11)	68	J	1300	50	250	NA	7/6/11 23:20		252541	
Vinyl Chloride	1300	U	1300	58	250	NA	7/6/11 23:20		252541	
cis-1,2-Dichloroethene	35000		1300	50	250	NA	7/6/11 23:20		252541	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
m,p-Xylenes	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
n-Butyl Acetate	55	J	1300	53	250	NA	7/6/11 23:20		252541	
o-Xylene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	
trans-1,2-Dichloroethene	190	J	1300	50	250	NA	7/6/11 23:20		252541	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	7/6/11 23:20		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	7/6/11 23:20	
Dibromofluoromethane	111	89-119	7/6/11 23:20	
Toluene-d8	96	87-121	7/6/11 23:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-051.0-20110630
Lab Code: R1103705-004

Service Request: R1103705
Date Collected: 6/30/11 0827
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.8	mg/L	1.0	10	NA	7/6/11 11:55	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 22:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT329-039.0-20110630
Lab Code: R1103705-006

Service Request: R1103705
Date Collected: 6/30/11 0955
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	49.7	mg/L	1.0	10	NA	7/6/11 12:09	
Iodide	300.0	25	mg/L	20	100	NA	7/12/11 16:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT329-039.0-20110630
 Lab Code: R1103705-006

Service Request: R1103705
 Date Collected: 6/30/11 0955
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50000	U	50000	2300	10000	NA	7/6/11 23:47		252541	
1,1,2,2-Tetrachloroethane	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,1,2-Trichloroethane	50000	U	50000	2300	10000	NA	7/6/11 23:47		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000	U	50000	3100	10000	NA	7/6/11 23:47		252541	
1,1-Dichloroethane (1,1-DCA)	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,1-Dichloroethene (1,1-DCE)	50000	U	50000	2900	10000	NA	7/6/11 23:47		252541	
1,2,4-Trichlorobenzene	50000	U	50000	2600	10000	NA	7/6/11 23:47		252541	
1,2-Dibromo-3-chloropropane (DBCP)	50000	U	50000	3800	10000	NA	7/6/11 23:47		252541	
1,2-Dibromoethane	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,2-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,2-Dichloroethane	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,2-Dichloropropane	50000	U	50000	2900	10000	NA	7/6/11 23:47		252541	
1,3-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
1,4-Dichlorobenzene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
n-Butanol	500000	U	500000		10000	NA	7/6/11 23:47		252541	
2-Butanone (MEK)	100000	U	100000	5100	10000	NA	7/6/11 23:47		252541	
2-Hexanone	100000	U	100000	3500	10000	NA	7/6/11 23:47		252541	
4-Methyl-2-pentanone	100000	U	100000	2700	10000	NA	7/6/11 23:47		252541	
Acetone	200000	U	200000	9800	10000	NA	7/6/11 23:47		252541	
Benzene	50000	U	50000	2100	10000	NA	7/6/11 23:47		252541	
Bromodichloromethane	2300	J	50000	2000	10000	NA	7/6/11 23:47		252541	
Bromoform	50000	U	50000	2700	10000	NA	7/6/11 23:47		252541	
Bromomethane	50000	U	50000	3100	10000	NA	7/6/11 23:47		252541	
Carbon Disulfide	100000	U	100000	2000	10000	NA	7/6/11 23:47		252541	
Carbon Tetrachloride	50000	U	50000	2700	10000	NA	7/6/11 23:47		252541	
Chlorobenzene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Chloroethane	50000	U	50000	3100	10000	NA	7/6/11 23:47		252541	
Chloroform	11000	J	50000	2200	10000	NA	7/6/11 23:47		252541	
Chloromethane	50000	U	50000	2400	10000	NA	7/6/11 23:47		252541	
Cyclohexane	100000	U	100000	2400	10000	NA	7/6/11 23:47		252541	
Dibromochloromethane	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Dichlorodifluoromethane (CFC 12)	50000	U	50000	5700	10000	NA	7/6/11 23:47		252541	
Dichloromethane	50000	U	50000	2200	10000	NA	7/6/11 23:47		252541	
Ethylbenzene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Isopropylbenzene (Cumene)	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Methyl Acetate	100000	U	100000	2300	10000	NA	7/6/11 23:47		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT329-039.0-20110630
Lab Code: R1103705-006

Service Request: R1103705
Date Collected: 6/30/11 0955
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Methylcyclohexane	100000	U	100000	2500	10000	NA	7/6/11 23:47		252541	
Styrene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Tetrachloroethene (PCE)	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Toluene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Trichloroethene (TCE)	10000	J	50000	2300	10000	NA	7/6/11 23:47		252541	
Trichlorofluoromethane (CFC 11)	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
Vinyl Chloride	50000	U	50000	2300	10000	NA	7/6/11 23:47		252541	
cis-1,2-Dichloroethene	14000	J	50000	2000	10000	NA	7/6/11 23:47		252541	
cis-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
m,p-Xylenes	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
n-Butyl Acetate	1100000		50000	2100	10000	NA	7/6/11 23:47		252541	
o-Xylene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
trans-1,2-Dichloroethene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	
trans-1,3-Dichloropropene	50000	U	50000	2000	10000	NA	7/6/11 23:47		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	7/6/11 23:47	
Dibromofluoromethane	107	89-119	7/6/11 23:47	
Toluene-d8	96	87-121	7/6/11 23:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT329-045.0-20110630
Lab Code: R1103705-007

Service Request: R1103705
Date Collected: 6/30/11 1012
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	45.8	mg/L	1.0	10	NA	7/6/11 08:36	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 23:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-039.0-20110630
Lab Code: R1103705-011

Service Request: R1103705
Date Collected: 6/30/11 1147
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.5	mg/L	1.0	10	NA	7/6/11 08:50	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 23:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT330-039.0-20110630
 Lab Code: R1103705-011

Service Request: R1103705
 Date Collected: 6/30/11 1147
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	7/7/11 00:14		252541	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	7/7/11 00:14		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	160	500	NA	7/7/11 00:14		252541	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	7/7/11 00:14		252541	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	7/7/11 00:14		252541	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	7/7/11 00:14		252541	
1,2-Dibromoethane	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,2-Dichloroethane	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,2-Dichloropropane	2500	U	2500	140	500	NA	7/7/11 00:14		252541	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
n-Butanol	25000	U	25000		500	NA	7/7/11 00:14		252541	
2-Butanone (MEK)	5000	U	5000	260	500	NA	7/7/11 00:14		252541	
2-Hexanone	5000	U	5000	180	500	NA	7/7/11 00:14		252541	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	7/7/11 00:14		252541	
Acetone	10000	U	10000	490	500	NA	7/7/11 00:14		252541	
Benzene	2500	U	2500	110	500	NA	7/7/11 00:14		252541	
Bromodichloromethane	190	J	2500	100	500	NA	7/7/11 00:14		252541	
Bromoform	2500	U	2500	140	500	NA	7/7/11 00:14		252541	
Bromomethane	2500	U	2500	160	500	NA	7/7/11 00:14		252541	
Carbon Disulfide	5000	U	5000	100	500	NA	7/7/11 00:14		252541	
Carbon Tetrachloride	2500	U	2500	140	500	NA	7/7/11 00:14		252541	
Chlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Chloroethane	2500	U	2500	160	500	NA	7/7/11 00:14		252541	
Chloroform	660	J	2500	110	500	NA	7/7/11 00:14		252541	
Chloromethane	2500	U	2500	120	500	NA	7/7/11 00:14		252541	
Cyclohexane	5000	U	5000	120	500	NA	7/7/11 00:14		252541	
Dibromochloromethane	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	7/7/11 00:14		252541	
Dichloromethane	2500	U	2500	110	500	NA	7/7/11 00:14		252541	
Ethylbenzene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Methyl Acetate	5000	U	5000	120	500	NA	7/7/11 00:14		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-039.0-20110630
Lab Code: R1103705-011

Service Request: R1103705
Date Collected: 6/30/11 1147
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Methylcyclohexane	5000	U	5000	130	500	NA	7/7/11 00:14		252541	
Styrene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Toluene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Trichloroethene (TCE)	530	J	2500	120	500	NA	7/7/11 00:14		252541	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
Vinyl Chloride	2500		2500	120	500	NA	7/7/11 00:14		252541	
cis-1,2-Dichloroethene	59000		2500	100	500	NA	7/7/11 00:14		252541	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
m,p-Xylenes	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
n-Butyl Acetate	15000		2500	110	500	NA	7/7/11 00:14		252541	
o-Xylene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	
trans-1,2-Dichloroethene	340	J	2500	100	500	NA	7/7/11 00:14		252541	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/7/11 00:14		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/7/11 00:14	
Dibromofluoromethane	111	89-119	7/7/11 00:14	
Toluene-d8	99	87-121	7/7/11 00:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-045.0-20110630
Lab Code: R1103705-012

Service Request: R1103705
Date Collected: 6/30/11 1244
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	27.9	mg/L	1.0	10	NA	7/6/11 09:04	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 23:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT330-045.0-20110630
 Lab Code: R1103705-012

Service Request: R1103705
 Date Collected: 6/30/11 1244
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	7/7/11 00:41		252541	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	7/7/11 00:41		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	160	500	NA	7/7/11 00:41		252541	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	7/7/11 00:41		252541	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	7/7/11 00:41		252541	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	7/7/11 00:41		252541	
1,2-Dibromoethane	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,2-Dichloroethane	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,2-Dichloropropane	2500	U	2500	140	500	NA	7/7/11 00:41		252541	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
n-Butanol	75000		5300	5300	500	NA	7/7/11 00:41		252541	
2-Butanone (MEK)	5000	U	5000	260	500	NA	7/7/11 00:41		252541	
2-Hexanone	5000	U	5000	180	500	NA	7/7/11 00:41		252541	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	7/7/11 00:41		252541	
Acetone	10000	U	10000	490	500	NA	7/7/11 00:41		252541	
Benzene	2500	U	2500	110	500	NA	7/7/11 00:41		252541	
Bromodichloromethane	170	J	2500	100	500	NA	7/7/11 00:41		252541	
Bromoform	2500	U	2500	140	500	NA	7/7/11 00:41		252541	
Bromomethane	2500	U	2500	160	500	NA	7/7/11 00:41		252541	
Carbon Disulfide	5000	U	5000	100	500	NA	7/7/11 00:41		252541	
Carbon Tetrachloride	2500	U	2500	140	500	NA	7/7/11 00:41		252541	
Chlorobenzene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Chloroethane	2500	U	2500	160	500	NA	7/7/11 00:41		252541	
Chloroform	660	J	2500	110	500	NA	7/7/11 00:41		252541	
Chloromethane	2500	U	2500	120	500	NA	7/7/11 00:41		252541	
Cyclohexane	5000	U	5000	120	500	NA	7/7/11 00:41		252541	
Dibromochloromethane	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	7/7/11 00:41		252541	
Dichloromethane	2500	U	2500	110	500	NA	7/7/11 00:41		252541	
Ethylbenzene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Methyl Acetate	5000	U	5000	120	500	NA	7/7/11 00:41		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-045.0-20110630
Lab Code: R1103705-012

Service Request: R1103705
Date Collected: 6/30/11 1244
Date Received: 7/2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Methylcyclohexane	5000	U	5000	130	500	NA	7/7/11 00:41		252541	
Styrene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Toluene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Trichloroethene (TCE)	3500		2500	120	500	NA	7/7/11 00:41		252541	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
Vinyl Chloride	2500	U	2500	120	500	NA	7/7/11 00:41		252541	
cis-1,2-Dichloroethene	20000		2500	100	500	NA	7/7/11 00:41		252541	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
m,p-Xylenes	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
n-Butyl Acetate	690000	D	25000	1100	5000	NA	7/7/11 14:07		252665	
o-Xylene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	
trans-1,2-Dichloroethene	130	J	2500	100	500	NA	7/7/11 00:41		252541	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	7/7/11 00:41		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	7/7/11 00:41	
Dibromofluoromethane	109	89-119	7/7/11 00:41	
Toluene-d8	97	87-121	7/7/11 00:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-051.0-20110630
Lab Code: R1103705-013

Service Request: R1103705
Date Collected: 6/30/11 1302
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	4.2	mg/L	1.0	10	NA	7/6/11 10:01	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/12/11 23:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT330-051.0-20110630
 Lab Code: R1103705-013

Service Request: R1103705
 Date Collected: 6/30/11 1302
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	7/7/11 01:09		252541	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	7/7/11 01:09		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	78	250	NA	7/7/11 01:09		252541	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	7/7/11 01:09		252541	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	7/7/11 01:09		252541	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	7/7/11 01:09		252541	
1,2-Dibromoethane	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,2-Dichloroethane	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,2-Dichloropropane	1300	U	1300	70	250	NA	7/7/11 01:09		252541	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
n-Butanol	19000		2700	2700	250	NA	7/7/11 01:09		252541	
2-Butanone (MEK)	2500	U	2500	130	250	NA	7/7/11 01:09		252541	
2-Hexanone	2500	U	2500	88	250	NA	7/7/11 01:09		252541	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	7/7/11 01:09		252541	
Acetone	5000	U	5000	250	250	NA	7/7/11 01:09		252541	
Benzene	1300	U	1300	53	250	NA	7/7/11 01:09		252541	
Bromodichloromethane	65	J	1300	50	250	NA	7/7/11 01:09		252541	
Bromoform	1300	U	1300	68	250	NA	7/7/11 01:09		252541	
Bromomethane	1300	U	1300	78	250	NA	7/7/11 01:09		252541	
Carbon Disulfide	2500	U	2500	50	250	NA	7/7/11 01:09		252541	
Carbon Tetrachloride	1300	U	1300	68	250	NA	7/7/11 01:09		252541	
Chlorobenzene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Chloroethane	1300	U	1300	78	250	NA	7/7/11 01:09		252541	
Chloroform	400	J	1300	55	250	NA	7/7/11 01:09		252541	
Chloromethane	1300	U	1300	60	250	NA	7/7/11 01:09		252541	
Cyclohexane	2500	U	2500	60	250	NA	7/7/11 01:09		252541	
Dibromochloromethane	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	7/7/11 01:09		252541	
Dichloromethane	1300	U	1300	55	250	NA	7/7/11 01:09		252541	
Ethylbenzene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Methyl Acetate	2500	U	2500	58	250	NA	7/7/11 01:09		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT330-051.0-20110630
Lab Code: R1103705-013

Service Request: R1103705
Date Collected: 6/30/11 1302
Date Received: 7/2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Methylcyclohexane	2500	U	2500	63	250	NA	7/7/11 01:09		252541	
Styrene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Toluene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Trichloroethene (TCE)	1300	U	1300	58	250	NA	7/7/11 01:09		252541	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
Vinyl Chloride	1300	U	1300	58	250	NA	7/7/11 01:09		252541	
cis-1,2-Dichloroethene	510	J	1300	50	250	NA	7/7/11 01:09		252541	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
m,p-Xylenes	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
n-Butyl Acetate	76000	D	2500	110	500	NA	7/7/11 14:34		252665	
o-Xylene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
trans-1,2-Dichloroethene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	7/7/11 01:09		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	7/7/11 01:09	
Dibromofluoromethane	111	89-119	7/7/11 01:09	
Toluene-d8	98	87-121	7/7/11 01:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-016.0-20110630
Lab Code: R1103705-014

Service Request: R1103705
Date Collected: 6/30/11 1348
Date Received: 7/2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U mg/L	1.0	10	NA	7/6/11 12:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-030.0-20110630
Lab Code: R1103705-015

Service Request: R1103705
Date Collected: 6/30/11 1401
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.8	mg/L	1.0	10	NA	7/6/11 10:15	
Iodide	300.0	2.8	mg/L	2.0	10	NA	7/12/11 23:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-039.0-20110630
Lab Code: R1103705-016

Service Request: R1103705
Date Collected: 6/30/11 1416
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	6.2	mg/L	1.0	10	NA	7/6/11 10:30	
Iodide	300.0	3.6	mg/L	2.0	10	NA	7/13/11 00:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-DPT331-039.0-20110630
 Lab Code: R1103705-016

Service Request: R1103705
 Date Collected: 6/30/11 1416
 Date Received: 7/2/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252665

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	13000	U	13000	580	2500	NA	7/7/11 15:02		252665	
1,1,2,2-Tetrachloroethane	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,1,2-Trichloroethane	13000	U	13000	580	2500	NA	7/7/11 15:02		252665	
1,1,2-Trichloro-1,2,2-trifluoroethane	50000		13000	780	2500	NA	7/7/11 15:02		252665	
1,1-Dichloroethane (1,1-DCA)	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,1-Dichloroethene (1,1-DCE)	13000	U	13000	730	2500	NA	7/7/11 15:02		252665	
1,2,4-Trichlorobenzene	13000	U	13000	650	2500	NA	7/7/11 15:02		252665	
1,2-Dibromo-3-chloropropane (DBCP)	13000	U	13000	950	2500	NA	7/7/11 15:02		252665	
1,2-Dibromoethane	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,2-Dichlorobenzene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,2-Dichloroethane	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,2-Dichloropropane	13000	U	13000	710	2500	NA	7/7/11 15:02		252665	
1,3-Dichlorobenzene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
1,4-Dichlorobenzene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
n-Butanol	27000	U	27000	27000	2500	NA	7/7/11 15:02		252665	
2-Butanone (MEK)	25000	U	25000	1300	2500	NA	7/7/11 15:02		252665	
2-Hexanone	25000	U	25000	880	2500	NA	7/7/11 15:02		252665	
4-Methyl-2-pentanone	25000	U	25000	680	2500	NA	7/7/11 15:02		252665	
Acetone	50000	U	50000	2500	2500	NA	7/7/11 15:02		252665	
Benzene	13000	U	13000	530	2500	NA	7/7/11 15:02		252665	
Bromodichloromethane	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Bromoform	13000	U	13000	680	2500	NA	7/7/11 15:02		252665	
Bromomethane	13000	U	13000	780	2500	NA	7/7/11 15:02		252665	
Carbon Disulfide	25000	U	25000	500	2500	NA	7/7/11 15:02		252665	
Carbon Tetrachloride	13000	U	13000	680	2500	NA	7/7/11 15:02		252665	
Chlorobenzene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Chloroethane	13000	U	13000	780	2500	NA	7/7/11 15:02		252665	
Chloroform	13000	U	13000	550	2500	NA	7/7/11 15:02		252665	
Chloromethane	13000	U	13000	600	2500	NA	7/7/11 15:02		252665	
Cyclohexane	25000	U	25000	600	2500	NA	7/7/11 15:02		252665	
Dibromochloromethane	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Dichlorodifluoromethane (CFC 12)	13000	U	13000	1500	2500	NA	7/7/11 15:02		252665	
Dichloromethane	13000	U	13000	550	2500	NA	7/7/11 15:02		252665	
Ethylbenzene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Isopropylbenzene (Cumene)	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Methyl Acetate	25000	U	25000	580	2500	NA	7/7/11 15:02		252665	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-039.0-20110630
Lab Code: R1103705-016

Service Request: R1103705
Date Collected: 6/30/11 1416
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252665

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Methylcyclohexane	25000	U	25000	630	2500	NA	7/7/11 15:02		252665	
Styrene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Tetrachloroethene (PCE)	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Toluene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Trichloroethene (TCE)	76000		13000	580	2500	NA	7/7/11 15:02		252665	
Trichlorofluoromethane (CFC 11)	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
Vinyl Chloride	13000	U	13000	580	2500	NA	7/7/11 15:02		252665	
cis-1,2-Dichloroethene	20000		13000	500	2500	NA	7/7/11 15:02		252665	
cis-1,3-Dichloropropene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
m,p-Xylenes	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
n-Butyl Acetate	360000		13000	530	2500	NA	7/7/11 15:02		252665	
o-Xylene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
trans-1,2-Dichloroethene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	
trans-1,3-Dichloropropene	13000	U	13000	500	2500	NA	7/7/11 15:02		252665	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	7/7/11 15:02	
Dibromofluoromethane	106	89-119	7/7/11 15:02	
Toluene-d8	94	87-121	7/7/11 15:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-045.0-20110630
Lab Code: R1103705-017

Service Request: R1103705
Date Collected: 6/30/11 1433
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.7	mg/L	1.0	10	NA	7/6/11 11:12	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 00:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-045.0-20110630
Lab Code: R1103705-017

Service Request: R1103705
Date Collected: 6/30/11 1433
Date Received: 7/2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/7/11 02:03		252541	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/7/11 02:03		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	56000		5000	310	1000	NA	7/7/11 02:03		252541	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/7/11 02:03		252541	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/7/11 02:03		252541	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/7/11 02:03		252541	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/7/11 02:03		252541	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
n-Butanol	50000	U	50000		1000	NA	7/7/11 02:03		252541	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/7/11 02:03		252541	
2-Hexanone	10000	U	10000	350	1000	NA	7/7/11 02:03		252541	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/7/11 02:03		252541	
Acetone	20000	U	20000	980	1000	NA	7/7/11 02:03		252541	
Benzene	5000	U	5000	210	1000	NA	7/7/11 02:03		252541	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Bromoform	5000	U	5000	270	1000	NA	7/7/11 02:03		252541	
Bromomethane	5000	U	5000	310	1000	NA	7/7/11 02:03		252541	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/7/11 02:03		252541	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/7/11 02:03		252541	
Chlorobenzene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Chloroethane	5000	U	5000	310	1000	NA	7/7/11 02:03		252541	
Chloroform	5000	U	5000	220	1000	NA	7/7/11 02:03		252541	
Chloromethane	5000	U	5000	240	1000	NA	7/7/11 02:03		252541	
Cyclohexane	10000	U	10000	240	1000	NA	7/7/11 02:03		252541	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/7/11 02:03		252541	
Dichloromethane	5000	U	5000	220	1000	NA	7/7/11 02:03		252541	
Ethylbenzene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Methyl Acetate	10000	U	10000	230	1000	NA	7/7/11 02:03		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT331-045.0-20110630
Lab Code: R1103705-017

Service Request: R1103705
Date Collected: 6/30/11 1433
Date Received: 7/ 2/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/7/11 02:03		252541	
Styrene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Toluene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Trichloroethene (TCE)	180000		5000	230	1000	NA	7/7/11 02:03		252541	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
Vinyl Chloride	5000	U	5000	230	1000	NA	7/7/11 02:03		252541	
cis-1,2-Dichloroethene	3700	J	5000	200	1000	NA	7/7/11 02:03		252541	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
n-Butyl Acetate	820	J	5000	210	1000	NA	7/7/11 02:03		252541	
o-Xylene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/7/11 02:03		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	7/7/11 02:03	
Dibromofluoromethane	110	89-119	7/7/11 02:03	
Toluene-d8	97	87-121	7/7/11 02:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: LC34-DPT328-057.0-20110630
Lab Code: R1103705-018

Service Request: R1103705
Date Collected: 6/30/11 0849
Date Received: 7/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.9	mg/L	1.0	10	NA	7/6/11 11:27	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 00:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103705-MB1

Service Request: R1103705
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	7/6/11 01:34	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	7/12/11 13:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103705-MB2

Service Request: R1103705
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	7/6/11 08:07	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	7/12/11 21:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106543-03

Service Request: R1103705
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/6/11 21:59		252541	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/6/11 21:59		252541	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/6/11 21:59		252541	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/6/11 21:59		252541	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	7/6/11 21:59		252541	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/6/11 21:59		252541	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/6/11 21:59		252541	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
n-Butanol	50	U	50	11	1	NA	7/6/11 21:59		252541	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/6/11 21:59		252541	
2-Hexanone	10	U	10	0.35	1	NA	7/6/11 21:59		252541	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/6/11 21:59		252541	
Acetone	20	U	20	0.98	1	NA	7/6/11 21:59		252541	
Benzene	5.0	U	5.0	0.21	1	NA	7/6/11 21:59		252541	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Bromoform	5.0	U	5.0	0.27	1	NA	7/6/11 21:59		252541	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/6/11 21:59		252541	
Carbon Disulfide	10	U	10	0.20	1	NA	7/6/11 21:59		252541	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/6/11 21:59		252541	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/6/11 21:59		252541	
Chloroform	5.0	U	5.0	0.22	1	NA	7/6/11 21:59		252541	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/6/11 21:59		252541	
Cyclohexane	10	U	10	0.24	1	NA	7/6/11 21:59		252541	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/6/11 21:59		252541	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/6/11 21:59		252541	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Methyl Acetate	10	U	10	0.23	1	NA	7/6/11 21:59		252541	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106543-03

Service Request: R1103705
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252541

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Methylcyclohexane	10	U	10	0.25	1	NA	7/6/11 21:59		252541	
Styrene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Toluene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/6/11 21:59		252541	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/6/11 21:59		252541	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/6/11 21:59		252541	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/6/11 21:59		252541	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	7/6/11 21:59	
Dibromofluoromethane	114	89-119	7/6/11 21:59	
Toluene-d8	99	87-121	7/6/11 21:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34-PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106596-03

Service Request: R1103705
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252665

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/7/11 10:02		252665	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/7/11 10:02		252665	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/7/11 10:02		252665	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/7/11 10:02		252665	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	7/7/11 10:02		252665	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/7/11 10:02		252665	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/7/11 10:02		252665	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
n-Butanol	11	U	11	11	1	NA	7/7/11 10:02		252665	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/7/11 10:02		252665	
2-Hexanone	10	U	10	0.35	1	NA	7/7/11 10:02		252665	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/7/11 10:02		252665	
Acetone	20	U	20	0.98	1	NA	7/7/11 10:02		252665	
Benzene	5.0	U	5.0	0.21	1	NA	7/7/11 10:02		252665	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Bromoform	5.0	U	5.0	0.27	1	NA	7/7/11 10:02		252665	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/7/11 10:02		252665	
Carbon Disulfide	10	U	10	0.20	1	NA	7/7/11 10:02		252665	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/7/11 10:02		252665	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/7/11 10:02		252665	
Chloroform	5.0	U	5.0	0.22	1	NA	7/7/11 10:02		252665	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/7/11 10:02		252665	
Cyclohexane	10	U	10	0.24	1	NA	7/7/11 10:02		252665	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/7/11 10:02		252665	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/7/11 10:02		252665	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Methyl Acetate	10	U	10	0.23	1	NA	7/7/11 10:02		252665	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106596-03

Service Request: R1103705
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 252665

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Methylcyclohexane	10	U	10	0.25	1	NA	7/7/11 10:02		252665	
Styrene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Toluene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/7/11 10:02		252665	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/7/11 10:02		252665	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/7/11 10:02		252665	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/7/11 10:02		252665	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	7/7/11 10:02	
Dibromofluoromethane	105	89-119	7/7/11 10:02	
Toluene-d8	96	87-121	7/7/11 10:02	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/6/11 -
7/12/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103705-LCS1			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.05	1.00	105	90 - 110
Iodide	300.0	0.958	1.00	96	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/6/11 -
7/12/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103705-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.05	1.00	105	90 - 110
Iodide	300.0	0.966	1.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/ 6/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 252541

**Lab Control Sample
 RQ1106543-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.9	20.0	100	72 - 128
1,1,2,2-Tetrachloroethane	15.7	20.0	79	72 - 131
1,1,2-Trichloroethane	18.5	20.0	93	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.6	20.0	83	71 - 134
1,1-Dichloroethane (1,1-DCA)	23.2	20.0	116	76 - 122
1,1-Dichloroethene (1,1-DCE)	17.1	20.0	85	72 - 129
1,2,4-Trichlorobenzene	19.3	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	15.7	20.0	79	62 - 131
1,2-Dibromoethane	18.6	20.0	93	78 - 125
1,2-Dichlorobenzene	20.2	20.0	101	79 - 124
1,2-Dichloroethane	24.5	20.0	122	78 - 126
1,2-Dichloropropane	20.8	20.0	104	80 - 123
1,3-Dichlorobenzene	20.3	20.0	101	78 - 124
1,4-Dichlorobenzene	20.2	20.0	101	78 - 123
n-Butanol	1060	1000	106	70 - 130
2-Butanone (MEK)	22.7	20.0	114	60 - 133
2-Hexanone	19.5	20.0	97	61 - 131
4-Methyl-2-pentanone	18.9	20.0	95	61 - 132
Acetone	22.3	20.0	111	59 - 140
Benzene	19.5	20.0	98	78 - 121
Bromodichloromethane	20.9	20.0	104	80 - 125
Bromoform	17.4	20.0	87	73 - 132
Bromomethane	17.2	20.0	86	57 - 144
Carbon Disulfide	18.8	20.0	94	59 - 138
Carbon Tetrachloride	22.2	20.0	111	69 - 135
Chlorobenzene	20.0	20.0	100	80 - 121
Chloroethane	20.4	20.0	102	71 - 130
Chloroform	21.0	20.0	105	78 - 125
Chloromethane	22.2	20.0	111	62 - 133
Cyclohexane	21.7	20.0	109	67 - 127
Dibromochloromethane	19.7	20.0	99	78 - 133
Dichlorodifluoromethane (CFC 12)	17.4	20.0	87	53 - 143

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/6/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 252541

**Lab Control Sample
 RQ1106543-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.1	20.0	91	75 - 125
Ethylbenzene	19.0	20.0	95	78 - 123
Isopropylbenzene (Cumene)	21.0	20.0	105	73 - 133
Methyl Acetate	22.6	20.0	113	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	21.4	20.0	107	64 - 133
Styrene	19.1	20.0	96	80 - 132
Tetrachloroethene (PCE)	19.9	20.0	99	72 - 131
Toluene	18.6	20.0	93	78 - 122
Trichloroethene (TCE)	20.0	20.0	100	74 - 127
Trichlorofluoromethane (CFC 11)	23.8	20.0	119	71 - 139
Vinyl Chloride	22.5	20.0	112	71 - 136
cis-1,2-Dichloroethene	19.5	20.0	97	78 - 122
cis-1,3-Dichloropropene	18.0	20.0	90	77 - 125
m,p-Xylenes	40.2	40.0	100	79 - 126
n-Butyl Acetate	17.9	20.0	90	54 - 127
o-Xylene	19.4	20.0	97	79 - 126
trans-1,2-Dichloroethene	18.8	20.0	94	75 - 121
trans-1,3-Dichloropropene	16.2	20.0	81	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/7/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 252665

**Lab Control Sample
 RQ1106596-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.2	20.0	96	72 - 128
1,1,2,2-Tetrachloroethane	16.2	20.0	81	72 - 131
1,1,2-Trichloroethane	17.3	20.0	86	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.4	20.0	77	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.1	20.0	105	76 - 124
1,1-Dichloroethene (1,1-DCE)	16.0	20.0	80	72 - 129
1,2,4-Trichlorobenzene	19.2	20.0	96	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	14.9	20.0	74	62 - 131
1,2-Dibromoethane	18.7	20.0	93	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	24.6	20.0	123	73 - 127
1,2-Dichloropropane	20.4	20.0	102	80 - 123
1,3-Dichlorobenzene	19.2	20.0	96	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
2-Butanone (MEK)	23.1	20.0	115	60 - 133
2-Hexanone	19.1	20.0	95	61 - 131
4-Methyl-2-pentanone	19.1	20.0	95	61 - 132
Acetone	18.0	20.0	90	54 - 139
Benzene	18.2	20.0	91	78 - 121
Bromodichloromethane	20.4	20.0	102	80 - 125
Bromoform	17.4	20.0	87	68 - 130
Bromomethane	16.2	20.0	81	57 - 144
Carbon Disulfide	19.4	20.0	97	52 - 140
Carbon Tetrachloride	21.3	20.0	106	68 - 133
Chlorobenzene	19.1	20.0	95	80 - 121
Chloroethane	19.2	20.0	96	71 - 130
Chloroform	19.2	20.0	96	78 - 125
Chloromethane	20.9	20.0	105	61 - 138
Cyclohexane	21.4	20.0	107	57 - 126
Dibromochloromethane	19.3	20.0	96	78 - 133
Dichlorodifluoromethane (CFC 12)	16.4	20.0	82	45 - 159
Dichloromethane	16.8	20.0	84	75 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34-PED TR0272
Sample Matrix: Water

Service Request: R1103705
Date Analyzed: 7/ 7/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 252665

**Lab Control Sample
 RQ1106596-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethylbenzene	18.0	20.0	90	78 - 123
Isopropylbenzene (Cumene)	19.2	20.0	96	73 - 133
Methyl Acetate	22.1	20.0	110	57 - 157
Methyl tert-Butyl Ether	18.1	20.0	90	75 - 126
Methylcyclohexane	21.9	20.0	110	61 - 125
Styrene	18.5	20.0	93	80 - 132
Tetrachloroethene (PCE)	18.1	20.0	90	72 - 131
Toluene	17.8	20.0	89	78 - 122
Trichloroethene (TCE)	18.1	20.0	90	74 - 127
Trichlorofluoromethane (CFC 11)	22.6	20.0	113	69 - 141
Vinyl Chloride	20.6	20.0	103	72 - 138
cis-1,2-Dichloroethene	18.5	20.0	92	78 - 122
cis-1,3-Dichloropropene	17.9	20.0	89	77 - 125
m,p-Xylenes	38.2	40.0	95	79 - 126
n-Butyl Acetate	17.6	20.0	88	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	17.1	20.0	85	75 - 121
trans-1,3-Dichloropropene	16.3	20.0	82	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: LC34 PED Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 130 Research Lane, Ste 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, Canada FAX: _____
 Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	REMARKS
LC34-DPT328-030.0-20110630	6/30/2011	7:36	-001	W	2	
LC34-DPT328-039.0-20110630	6/30/2011	7:53	-002	W	2	
LC34-DPT328-045.0-20110630	6/30/2011	8:10	-003	W	2	
LC34-DPT328-051.0-20110630	6/30/2011	8:27	-004	W	2	
LC34-DPT328-057.0-20110630	6/30/2011	8:44	-005	W	2	JS
LC34-DPT329-030.0-20110630	6/30/2011	9:31	-005	W	2	
LC34-DPT329-039.0-20110630	6/30/2011	9:55	-006	W	2	
LC34-DPT329-045.0-20110630	6/30/2011	10:12	-007	W	2	
LC34-DPT329-051.0-20110630	6/30/2011	10:29	-008	W	2	
LC34-DPT328-057.0-20110630	6/30/2011	8:49	-018	W	1	CA 7/05/11

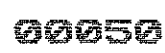
Comments/Special Instructions:
 Analyze samples per instructions from Cory Repta
 Some samples p/ten hold as per client R1103705 email 7/16/11

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogates, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: _____

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Jessie Barrett
 Firm: GEOSYNTEC
 Date/Time: 7/11/11 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: PEDEY
 Firm: _____
 Date/Time: _____

Revised cofc



Project Name: LC34 PED Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 130 Research Lane, Ste 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, Canada FAX: _____
 Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	Analysis Requested	REMARKS
LC34-DPT328-030.0-20110630	6/30/2011	7:36	051	W	2	X	
LC34-DPT328-039.0-20110630	6/30/2011	7:53	2	W	2	X	
LC34-DPT328-045.0-20110630	6/30/2011	8:10	3	W	2	X	
LC34-DPT328-051.0-20110630	6/30/2011	8:27	4	W	2	X	
LC34-DPT328-057.0-20110630	6/30/2011	8:44	5	W	2	X	JS
LC34-DPT329-030.0-20110630	6/30/2011	9:31	5	W	2	X	
LC34-DPT329-039.0-20110630	6/30/2011	9:55	6	W	2	X	
LC34-DPT329-045.0-20110630	6/30/2011	10:12	7	W	2	X	
LC34-DPT329-051.0-20110630	6/30/2011	10:29	8	W	2	X	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: _____

Comments/Special Instructions:
 Analyze samples per instructions from Cory Repta
 Some analyzed samples return hold
 as per client email KB 7/5/11
 R1103705

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 7/1/11 - 1030

RECEIVED BY:
 Signature: [Signature]
 Printed Name: B. Doyle
 Firm: CAS
 Date/Time: 7/1/11 0942

R1103705
 Geosyntec Consultants
 LC34-PED TR0272



Project Name: LC34 PED Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 130 Research Lane, Ste 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, Canada FAX:
 Sampler's Signature: _____

Sample ID	Date	Time	LAB ID	Matrix	Number of Containers	REMARKS
LC34-DPT330-010.0-20110630	6/30/2011	11:19	-009	W	2	
LC34-DPT330-030.0-20110630	6/30/2011	11:32	-010	W	2	
LC34-DPT330-039.0-20110630	6/30/2011	11:47	-011	W	2	
LC34-DPT330-045.0-20110630	6/30/2011	12:44	-012	W	2	
LC34-DPT330-051.0-20110630	6/30/2011	13:02	-013	W	2	
LC34-DPT331-016.0-20110630	6/30/2011	13:48	-014	W	2	
LC34-DPT331-030.0-20110630	6/30/2011	14:01	-015	W	2	
LC34-DPT331-039.0-20110630	6/30/2011	14:16	-016	W	2	
LC34-DPT331-045.0-20110630	6/30/2011	14:33	-017	W	2	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
Invoice Information
 P.O. # _____
 Bill to: TR0272

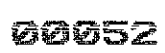
REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: _____

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: *Jessie Bate*
 Firm: *Geosyntec*
 Date/Time: *7/1/11 - 1030*

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Comments/Special Instructions:
 Analyze samples per instructions from Cory Repta
 Some samples put on hold as per client email 6/27/11
 R1103705

Revised copy



Project Name: LC34 PED Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 130 Research Lane, Ste 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, Canada FAX:

Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-DPT330-010.0-20110630	6/30/2011	11:19	9	W
LC34-DPT330-030.0-20110630	6/30/2011	11:32	10	W
LC34-DPT330-039.0-20110630	6/30/2011	11:47	11	W
LC34-DPT330-045.0-20110630	6/30/2011	12:44	12	W
LC34-DPT330-051.0-20110630	6/30/2011	13:02	13	W
LC34-DPT331-016.0-20110630	6/30/2011	13:48	14	W
LC34-DPT331-030.0-20110630	6/30/2011	14:01	15	W
LC34-DPT331-039.0-20110630	6/30/2011	14:16	16	W
LC34-DPT331-045.0-20110630	6/30/2011	14:33	17	W

Number of Containers

B, I

8260C

REMARKS

TURNAROUND REQUIREMENTS

24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS

- I. Routine Report: Results and Method Blank (Surrogate, as required)
- II. Results w/ QC (Dup., MS, MSD as req)
- III. Results (with QC and Calibration Summaries)
- IV. ASP-B
- V. CLP
- EDD?: _____

RELINQUISHED BY:

Signature: [Signature]
 Printed Name: Joseph Batek
 Firm: Geosyntec
 Date/Time: 7/1/11 - 1030

RECEIVED BY:

Signature: [Signature]
 Printed Name: P. DEX
 Firm: _____
 Date/Time: _____

Comments/Special Instructions:

Analyze samples per instructions from Cory Repta

Some samples/analyses returned held as per client email. KB 7/5/11

R1103705

RELINQUISHED BY:

Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:

Signature: [Signature]
 Printed Name: B. Bayle
 Firm: CAS
 Date/Time: 7/2/11 0942

R1103705
 GeoSyntec Consultants
 LC34-PED TR0272



Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R110305

Cooler received on 7/2/11 by: BD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 2.1°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 7/2@0948

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples:
 PC Secondary Review: UB 7/2/11

Cooler Breakdown: Date: 7/5/11 Time: 1014 by: dlw

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 2. Did all bottle labels and tags agree with custody papers? YES NO
 3. Were correct containers used for the tests indicated? YES NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	
		YES	NO							
≥12	NaOH									Yes = All samples OK No = Samples were preserved at lab as listed PM OK to Adjust:
≤2	HNO ₃									
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet				
	Zn Aceta	-	-							
	HCl	*	*							

Bottle lot numbers: 053011-2V
 Other Comments: _____

PC Secondary Review: UB 7/2/11

*significant air bubbles: VOA > 5-6 mm : WC > 2mm diameter



KB LABS, INC.

25132 SW 1st Ave
Newberry, Florida 32669

Telephone (352) 472-5830

Fax (352) 472-5832

Email: info@kbmobilelabs.com

July 6, 2011

Rebecca DaPrato
GeoSyntec Consultants
6770 S. Washington Ave, Suite 3
Titusville, FL 32780

**RE: NASA CCAFS LC34, KSC, FL - Final Data Report
KB Labs Project # 11-107**

Dear Ms. DaPrato:

Enclosed is the final report of the on-site analysis performed by KB Labs, Inc. at the above referenced site. Samples were collected and analyzed on June 30, 2011. Included are a brief project narrative, data report narrative, tables listing quality control results, final analytical results, and sample chain-of-custody form.

KB Labs' mobile laboratories have been inspected by the FDOH Bureau of Laboratories and are NELAP Certified as of April 1, 2003. Our personnel, methodology, proficiency testing, and quality assurance requirements comply with the guidelines of Chapter 62-160 of the Florida Administrative Code and with the consensus standards adopted at the National Environmental Laboratory Accreditation Conference (NELAC). Data for the site referenced above were determined in accordance with published procedures under Test Methods for Evaluating Solid Waste (EPA SW-846, Update III Revised May 1997). Unless otherwise indicated on the quality control narrative accompanying the data report, the quality assurance and quality control procedures performed in conjunction with analysis of groundwater samples demonstrated that the reported data met our requirements for accuracy and precision under NELAC Standards.

If you have any questions, please do not hesitate to call me or Kelly Bergdoll, President of KB Labs, at (352) 367-0073.

Sincerely,

KB Labs, Inc.

Todd Romero
Director of Operations

"KB Labs is a small, woman-owned business enterprise."



KB Labs, Inc.
25132 SW 1st Ave
Newberry, FL 32669
Phone: 352-472-5830
Fax: 352-472-5832
Email: info@kbmobilelabs.com

PROJECT NARRATIVE

Project Scope

On June 30, 2011, a total of 19 water samples were analyzed for GeoSyntec Consultants at KSC, Winter Park, FL. The samples were analyzed for vinyl chloride, freon 113, 1,1-dichloroethene, cis- and trans-1, 2-dichloroethene, trichloroethene, tetrachloroethene, and n-butyl-acetate.

NELAP Certification

KB Mobile Labs Unit KB1: FDOH NELAP Certification Number E8281

KB Labs is not certified for Freon 113 and n-butylacetate. Data should be considered screening level only.

Analytical Procedure

All samples were analyzed using SW846 Method 5030/8260 for waters. Ten (10) milliliters (mL) of water or air (air samples) were purged with helium and the volatile organic compounds (VOCs) were collected on a solid-phase adsorption trap. The adsorption trap was heated and back-purged with helium. The components were then separated by capillary column gas chromatography and measured with a mass spectrometer (GC/MS) operated in the electron impact full-scan mode. The individual VOCs in the samples were measured against corresponding VOC standards.

Analytical Results

Laboratory results were provided to the client on an as-completed or next-day basis. Final results of the on-site analyses are provided in a hardcopy report. The data produced and reported in the field has been reviewed and approved for this final report by the Director of Operations for KB Labs.

Uncertainty of Reported Values

All measurement data presented in this report are subject to a degree of uncertainty and the degree of uncertainty varies with each compound of interest. KB Labs estimates the uncertainty of each measurement using a statistical evaluation of the standard deviation from the mean percent recovery of a number of trials of a given measurement. More specifically, KB Labs maintains historical percent recovery control limits at the 99% confidence level for each analyte of interest. These are calculated as ± 3 times the standard deviation from the mean of historical measurements of the percent recovery of

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Newberry, FL 32669
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Fax: 352-472-5832
Email: info@kbmobilelabs.com

spikes of the analytes of interest into actual and control sample matrices. For example, if the lower and upper percent recovery control limits for a specific analyte of interest have been determined to be 70 and 100 percent respectively, a reported value of 10.0 ug/L will be with 99% confidence 7.0 to 13.0 ug/L. For more information about KB Labs estimation of uncertainty, contact KB Labs' quality assurance officer and/or request a copy of KB Labs' SOP for determining measurement uncertainty.

Quality Control (QC) Data

Surrogate Recoveries – Table 1 lists the daily analytical sequence and percent recovery results for surrogate compounds, which were added to all analyses. Four (4) surrogate compounds were added to each analysis in order to continually monitor general method performance.

VOC Spike Recoveries – Table 2 lists the percent recovery results for matrix spike and laboratory control samples. A known amount of each target compound was added to selected field samples and to laboratory reagent water in order to monitor the performance of each of the target compounds in the actual matrix and in laboratory reagent water.

Method Blanks – Daily analysis of laboratory reagent water samples was performed in order to monitor the cleanliness of the analytical system.

DATA REPORT NARRATIVE

1. All sample data has been reviewed and, if required, updated in the Final Data Report for rounding and significant figures.
2. Changes for sample ID LC34-DPT329-045.0-20110630 from Field Data Report:
Freon 113 1200 ug/L changed to 5000 ug/L.
Trichloroethene 39000 ug/L changed to 34000 ug/L.
3. Sample ID LC34-DPT330-045.0-20110630 reported trichloroethene 38000 ug/L in Field Report. Changed to 3800 ug/L.
4. As per NASA Client request for diluted samples between the lab RL and MDL are reported with FDEP Data Qualifier "I". Some results were changed from the Field Report to the Final Report to reflect this requirement.
5. Because there is no MDL for n-Butylacetate, values below PQL are reported with FDEP Data Qualifier "J" for estimated data.

"KB Labs is a small, woman-owned business enterprise."

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: GeoSyntec Consultants	Driller/Sampler: GeoSyntec Consultants	Analyst: Brad Weichert
Site: NASA CCAFS LC34	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 11-107
On-site Dates: 6/30/11	Client Project Manager: Rebecca DaPrato	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
BLANK	06/29/11	101	98	106	102	Pass	Pass	Pass	Pass
VSTD 1	06/29/11	99	100	102	100	Pass	Pass	Pass	Pass
VSTD 5	06/29/11	98	101	100	98	Pass	Pass	Pass	Pass
VSTD 10	06/29/11	97	99	100	103	Pass	Pass	Pass	Pass
VSTD 20	06/29/11	108	102	98	99	Pass	Pass	Pass	Pass
VSTD 50	06/29/11	94	96	101	100	Pass	Pass	Pass	Pass
VSTD 100	06/29/11	104	101	98	101	Pass	Pass	Pass	Pass
VSTD 20	06/30/11	99	97	102	99	Pass	Pass	Pass	Pass
VSTD 20	06/30/11	95	96	101	102	Pass	Pass	Pass	Pass
BLANK	06/30/11	107	104	100	99	Pass	Pass	Pass	Pass
LC34-DPT328-030.0 1:1000	06/30/11	107	102	102	99	Pass	Pass	Pass	Pass
LC34-DPT328-039.0 1:1000	06/30/11	104	98	101	98	Pass	Pass	Pass	Pass
LC34-DPT328-045.0 1:500	06/30/11	104	100	98	98	Pass	Pass	Pass	Pass
LC34-DPT328-051.0 1:10	06/30/11	108	101	99	98	Pass	Pass	Pass	Pass
LC34-DPT328-057.0	06/30/11	110	110	94	95	Pass	Pass	Pass	Pass
LC34-DPT329-030.0 1:10000	06/30/11	96	91	97	95	Pass	Pass	Pass	Pass
LC34-DPT329-039.0 1:1000	06/30/11	97	93	97	94	Pass	Pass	Pass	Pass
LC34-DPT329-045.0 1:2000	06/30/11	108	101	99	95	Pass	Pass	Pass	Pass
LC34-DPT329-051.0 1:5000	06/30/11	102	99	95	92	Pass	Pass	Pass	Pass
LC34-DPT330-010.0 1:5	06/30/11	100	97	96	93	Pass	Pass	Pass	Pass
LC34-DPT330-030.0 1:500	06/30/11	112	107	96	94	Pass	Pass	Pass	Pass
LC34-DPT330-039.0 1:500	06/30/11	101	95	94	90	Pass	Pass	Pass	Pass
LC34-DPT330-045.0 1:2000	06/30/11	109	108	96	93	Pass	Pass	Pass	Pass
LC34-DPT330-051.0 1:200	06/30/11	108	110	95	97	Pass	Pass	Pass	Pass
LC34-DPT331-016.0 1:200	06/30/11	108	106	96	94	Pass	Pass	Pass	Pass
LC34-DPT331-030.0 1:2000	06/30/11	111	107	93	94	Pass	Pass	Pass	Pass
LC34-DPT331-039.0 1:1000	06/30/11	111	112	97	95	Pass	Pass	Pass	Pass
LC34-DPT331-045.0 1:2000	06/30/11	110	107	97	97	Pass	Pass	Pass	Pass
IDW-183863-20110630 1:50	06/30/11	108	106	96	94	Pass	Pass	Pass	Pass
LC34-DPT328-057.0 MS	06/30/11	108	103	95	94	Pass	Pass	Pass	Pass
LC34-DPT328-057.0 MSD	06/30/11	108	101	96	96	Pass	Pass	Pass	Pass
LCS	06/30/11	106	104	93	99	Pass	Pass	Pass	Pass
CCS	06/30/11	104	101	95	97	Pass	Pass	Pass	Pass

Comments: Although some surrogates may be out of the control percent recovery range, other supporting QC, such as matrix spikes, matrix spike duplicates, method blanks, and laboratory control samples, are performed by KB Labs to further validate reported data.

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (84% - 121%)
- S2 = 1,2- Dichloroethane-D4 (69% - 133%)
- S3 = Toluene-D8 (87% - 111%)
- S4 = 4-Bromofluorobenzene (76% - 125%)

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: GeoSyntec Consultants	Driller/Sampler: GeoSyntec Consultants	Analyst: Brad Weichert
Site: NASA CCAFS LC34	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 11-107
Onsite Dates: 6/30/11	Client Project Manager: Rebecca DaPrato	Matrix: Water

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Samples: LC34-DPT328-057.0	Date of Analysis: 6/30/2011								
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Vinyl Chloride	46	156	20	91	94	4	Pass	Pass	Pass
Freon 113	50	143	20	10	10	4	< LCL	< LCL	Pass
1,1-Dichloroethene	47	150	20	90	95	6	Pass	Pass	Pass
Trans-1,2-Dichloroethene	61	135	20	91	97	7	Pass	Pass	Pass
Cis-1,2-Dichloroethene	62	141	20	90	111	20	Pass	Pass	> RPD
Trichloroethene	60	127	20	110	116	5	Pass	Pass	Pass
Tetrachloroethene	50	132	20	94	99	5	Pass	Pass	Pass
n-Butyl- Acetate	70	130	100	82	95	15	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit and method guidelines.

Laboratory Control Spikes (LCS):

Samples: LCS 1	Date of Analysis: 6/30/2011								
Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	LCS#1				LCS#1		
Vinyl Chloride	52	to 150	90				Pass		
Freon 113	59	to 168	10				< LCL		
1,1-Dichloroethene	58	to 132	92				Pass		
Trans-1,2-Dichloroethene	54	to 140	92				Pass		
Cis-1,2-Dichloroethene	67	to 126	110				Pass		
Trichloroethene	68	to 119	97				Pass		
Tetrachloroethene	58	to 127	94				Pass		
n-Butyl- Acetate	70	to 130	138				> UCL		

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit and method guidelines.



KB LABS, INC.

Final Data Report
 Project Number : 11-107
 NASA CCAFS LC34
 KSC, FL

Prepared for: GeoSyntec Consultants

Sample ID	Analysis Date	Matrix	Dilution Factor	Vinyl chloride	Freon 113	1,1-Dichloroethene	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	n-Butyl Acetate
Water MDL (ug/L)				0.24	NA	0.29	0.28	0.27	0.29	0.30	NA
LC34-DPT328-030.0-20110630	6/30/11	Water	1000	<240 I	<1000	<1000	500 I	45000	4100	<1000	1500 J
LC34-DPT328-039.0-20110630	6/30/11	Water	1000	1600	<1000	<1000	330 I	52000	1400	<1000	19000
LC34-DPT328-045.0-20110630	6/30/11	Water	500	<120 I	<500	<500	210 I	34000	2100	<500	640 J
LC34-DPT328-051.0-20110630	6/30/11	Water	10	4.4 I	<10	<10	<10	250	4.5 I	<10	26 J
LC34-DPT328-057.0-20110630	6/30/11	Water	1	<1.0	<1.0	<1.0	<1.0	64.8	1.3	<1.0	440
LC34-DPT329-030.0-20110630	6/30/11	Water	10000	<2400 I	18000	<10000	<10000	4800 I	<2900 I	<10000	1300000
LC34-DPT329-039.0-20110630	6/30/11	Water	1000	<240 I	1400	<1000	<1000	11000	11000	<1000	1200000
LC34-DPT329-045.0-20110630	6/30/11	Water	2000	<480 I	5000	<2000	<2000	4900	34000	<2000	1300000
LC34-DPT329-051.0-20110630	6/30/11	Water	5000	<1200 I	4100 I	<5000	<5000	<5000	9000	<5000	1700000
LC34-DPT330-010.0-20110630	6/30/11	Water	5	12	<5.0	<5.0	7.0	230	3.8 I	<5.0	1600
LC34-DPT330-030.0-20110630	6/30/11	Water	500	240 I	<500	<500	510	38000	1700	<500	19000
LC34-DPT330-039.0-20110630	6/30/11	Water	500	2300	<500	<500	290 I	50000	640	<500	20000
LC34-DPT330-045.0-20110630	6/30/11	Water	2000	<480 I	<2000	<2000	<2000	20000	3800	<2000	860000
LC34-DPT330-051.0-20110630	6/30/11	Water	200	<48 I	<200	<200	<200	1200	<58 I	<200	97000



KB LABS, INC.

Final Data Report
 Project Number : 11-107
 NASA CCAFS LC34
 KSC, FL

Prepared for: GeoSyntec Consultants

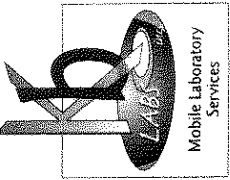
Sample ID	Analysis Date	Matrix	Dilution Factor	Vinyl chloride	Freon 113	1,1-Dichloroethene	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene	n-Butyl Acetate
Water MDL (ug/L)				0.24	NA	0.29	0.28	0.27	0.29	0.30	NA
LC34-DPT331-016.0-20110630	6/30/11	Water	200	1000	18000	<200	390	14000	<58 l	<200	1700
LC34-DPT331-030.0-20110630	6/30/11	Water	2000	960 l	180000	<2000	<2000	15000	24000	<2000	24000
LC34-DPT331-039.0-20110630	6/30/11	Water	1000	<240 l	44000	<1000	<1000	20000	72000	<1000	490000
LC34-DPT331-045.0-20110630	6/30/11	Water	2000	<480 l	68000	<2000	<2000	4700	190000	<2000	55000
LC34-IDW-183863-20110630	6/30/11	Water	50	28 l	2000	<50	<50	1200	1000	<50	7000

CHAIN-OF-CUSTODY RECORD

25132 SW 1st Avenue
Newberry, FL 32669
TEL (352) 367-0073
FAX (352) 472-5832

200 Quade Drive
Cary, NC 27513
TEL (919) 678-0030

MOBILE UNIT #
1531



CLIENT NAME	PROJECT NAME & ADDRESS										MOBILE UNIT #		
Greasy/Tec SAMPLERS	L634										1531		
	CONTACT PERSON DeBartlett												
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.		VOLATILES	IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS	NUMBER OF CONTAINERS	PRESERVATION C Chilled H HCL Ot Other (see Remarks)	COMMENT / SAMPLE PRE FIX
	L634												
DPT 328-039.0-2010630	0776	0740		✓ 6/30/11	0740	0755							
039.0	0810	0815			0815								
045.0	0824	0830			0830								
057.0	0849	0857			0857								
DPT 329-030.0	0931	0935			0935	1000							Very Strong nRB color
039.0	1012	1015			1015								
045.0	1024	1035			1035								
057.0	1119	1125			1125								
DPT 330-010.0	1132	1135			1135								
030.0	1147	1150			1150								
039.0	1244	1250			1250								
045.0	1302	1305			1305								
057.0	1348	1350			1350								
DPT 331-038.0-016.0													
Reinquired by: (Signature)	Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations						
			[Signature]		6/30/11								
Reinquired by: (Signature)	Date / Time		Received by: (Signature)		Date / Time								
			[Signature]		6/30/11								

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas

August 02, 2011

Service Request No: R1103812

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on July 8, 2011. For your reference, these analyses have been assigned our service request number **R1103812**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1103812
Date Received: 780/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Eleven (11) water samples were collected by the client on 7/7/11 and were received for analysis at Columbia Analytical Services on 7/8/11 via a national courier. The samples were received at a cooler temperature of 3.0°C within the guidelines of 0-6°C.

Volatile Organic Compounds

Eleven (11) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for 1,1,1-Trichloroethane (23.0), 1,2-Dichloroethane (20.2), Carbon Disulfide (25.0), Chloroform (20.9) and Trichlorofluoromethane (21.8) which were above the 20 %D on the 7/10/11 run. Any hits for these compounds on associated runs would be considered estimated and are flagged as "J". Hits were between the MRL and MDL.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Hits above the calibration range of the standards are repeated at the appropriate dilution for the hit. The data is flagged as "D" on the report. The sample data is reported in a merged format to be consistent with other reports for this project at the client's request.

All samples were analyzed within 7 days from collection, the holding time for unpreserved vials which were to be used for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination except for a 1,2,4-Trichlorobenzene hit in the 7/10/11 blank and 1,2,4-Trichlorobenzene, Acetone, and Chloroform in the 7/11/11 blank. No data required "B" flags however.

No other analytical or QC problems were encountered.

Inorganic Parameters

Eleven () water samples were analyzed for Bromide and Iodide by IC method 300.0.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

Approved by



Date

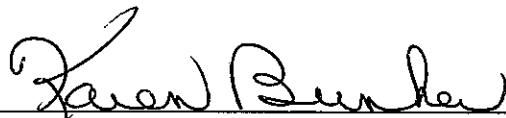
8/3/11

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1103812

<u>Lab ID</u>	<u>Client ID</u>
R1103812-001	LC34-BW0001C-038.5-20110707
R1103812-002	LC34-BW0001D-045.5-20110707
R1103812-003	LC34-BW0001E-052.5-20110707
R1103812-004	LC34-BW0002C-038.5-20110707
R1103812-005	LC34-BW0002D-045.5-20110707
R1103812-006	LC34-BW0002E-052.5-20110707
R1103812-007	LC34-BW0003C-038.5-20110707
R1103812-008	LC34-BW0003D-045.5-20110707
R1103812-009	LC34-BW0003E-052.5-20110707
R1103812-010	LC34-RW0007-038.5-20110707
R1103812-011	LC34-RW0008-052.0-20110707

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the “Notes” column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an “immediate” hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nebraska Accredited
Connecticut ID # PH0556	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
DoD ELAP #65817	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158

¹ Analyses were performed according to our laboratory’s NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001C-038.5-20110707
 Lab Code: R1103812-001

Service Request: R1103812
 Date Collected: 7/7/11 0900
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 02:38		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 02:38		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	19000		5000	310	1000	NA	7/11/11 02:38		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 02:38		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 02:38		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 02:38		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 02:38		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
n-Butanol	320000		250000	11000	1000	NA	7/11/11 02:38		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 02:38		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 02:38		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 02:38		253001	
Acetone	20000	U	20000	980	1000	NA	7/11/11 02:38		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 02:38		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 02:38		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 02:38		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 02:38		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 02:38		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 02:38		253001	
Chloroform	5000	U	5000	220	1000	NA	7/11/11 02:38		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 02:38		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 02:38		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 02:38		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 02:38		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 02:38		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110707
Lab Code: R1103812-001

Service Request: R1103812
Date Collected: 7/7/11 0900
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 02:38		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Trichloroethene (TCE)	52000		5000	230	1000	NA	7/11/11 02:38		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
Vinyl Chloride	510	J	5000	230	1000	NA	7/11/11 02:38		253001	
cis-1,2-Dichloroethene	21000		5000	200	1000	NA	7/11/11 02:38		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
n-Butyl Acetate	420000	D	25000	1100	5000	NA	7/12/11 18:11		253196	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	
trans-1,2-Dichloroethene	270	J	5000	200	1000	NA	7/11/11 02:38		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 02:38		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	7/11/11 02:38	
Dibromofluoromethane	104	89-119	7/11/11 02:38	
Toluene-d8	107	87-121	7/11/11 02:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110707
Lab Code: R1103812-001

Service Request: R1103812
Date Collected: 7/7/11 0900
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	14.8		mg/L	1.0	10	NA	7/26/11 15:27	
Iodide	300.0	22		mg/L	20	100	NA	7/12/11 19:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110707
Lab Code: R1103812-002

Service Request: R1103812
Date Collected: 7/ 7/11 0932
Date Received: 7/ 8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	3.6	mg/L	1.0	10	NA	7/26/11 15:41	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 00:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110707
Lab Code: R1103812-002

Service Request: R1103812
Date Collected: 7/ 7/11 0932
Date Received: 7/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253001

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 03:08		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 03:08		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	39000		5000	310	1000	NA	7/11/11 03:08		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 03:08		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 03:08		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 03:08		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 03:08		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
n-Butanol	23000	J	250000	11000	1000	NA	7/11/11 03:08		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 03:08		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 03:08		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 03:08		253001	
Acetone	1700	J	20000	980	1000	NA	7/11/11 03:08		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 03:08		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 03:08		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 03:08		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 03:08		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 03:08		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 03:08		253001	
Chloroform	5000	U	5000	220	1000	NA	7/11/11 03:08		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 03:08		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 03:08		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 03:08		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 03:08		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 03:08		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110707
Lab Code: R1103812-002

Service Request: R1103812
Date Collected: 7/7/11 0932
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253001

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 03:08		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Trichloroethene (TCE)	170000		5000	230	1000	NA	7/11/11 03:08		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
Vinyl Chloride	5000	U	5000	230	1000	NA	7/11/11 03:08		253001	
cis-1,2-Dichloroethene	5600		5000	200	1000	NA	7/11/11 03:08		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
n-Butyl Acetate	60000		5000	210	1000	NA	7/11/11 03:08		253001	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 03:08		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	7/11/11 03:08	
Dibromofluoromethane	102	89-119	7/11/11 03:08	
Toluene-d8	106	87-121	7/11/11 03:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110707
Lab Code: R1103812-003

Service Request: R1103812
Date Collected: 7/7/11 1002
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.2	mg/L	1.0	10	NA	7/26/11 15:55	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 00:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20110707
 Lab Code: R1103812-003

Service Request: R1103812
 Date Collected: 7/7/11 1002
 Date Received: 7/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100	U	100	4.7	20	NA	7/11/11 16:05		253085	
1,1,2,2-Tetrachloroethane	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,1,2-Trichloroethane	100	U	100	4.7	20	NA	7/11/11 16:05		253085	
1,1,2-Trichloro-1,2,2-trifluoroethane	100	U	100	6.2	20	NA	7/11/11 16:05		253085	
1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,1-Dichloroethene (1,1-DCE)	100	U	100	5.8	20	NA	7/11/11 16:05		253085	
1,2,4-Trichlorobenzene	100	U	100	5.2	20	NA	7/11/11 16:05		253085	
1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	7.6	20	NA	7/11/11 16:05		253085	
1,2-Dibromoethane	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,2-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,2-Dichloroethane	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,2-Dichloropropane	100	U	100	5.7	20	NA	7/11/11 16:05		253085	
1,3-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
1,4-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
n-Butanol	1500	J	5000	210	20	NA	7/11/11 16:05		253085	
2-Butanone (MEK)	200	U	200	11	20	NA	7/11/11 16:05		253085	
2-Hexanone	200	U	200	7.0	20	NA	7/11/11 16:05		253085	
4-Methyl-2-pentanone	200	U	200	5.4	20	NA	7/11/11 16:05		253085	
Acetone	400	U	400	20	20	NA	7/11/11 16:05		253085	
Benzene	100	U	100	4.2	20	NA	7/11/11 16:05		253085	
Bromodichloromethane	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Bromoform	100	U	100	5.4	20	NA	7/11/11 16:05		253085	
Bromomethane	100	U	100	6.2	20	NA	7/11/11 16:05		253085	
Carbon Disulfide	200	U	200	4.0	20	NA	7/11/11 16:05		253085	
Carbon Tetrachloride	100	U	100	5.4	20	NA	7/11/11 16:05		253085	
Chlorobenzene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Chloroethane	100	U	100	6.2	20	NA	7/11/11 16:05		253085	
Chloroform	100	U	100	4.4	20	NA	7/11/11 16:05		253085	
Chloromethane	100	U	100	4.8	20	NA	7/11/11 16:05		253085	
Cyclohexane	200	U	200	4.8	20	NA	7/11/11 16:05		253085	
Dibromochloromethane	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Dichlorodifluoromethane (CFC 12)	100	U	100	12	20	NA	7/11/11 16:05		253085	
Dichloromethane	100	U	100	4.4	20	NA	7/11/11 16:05		253085	
Ethylbenzene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Isopropylbenzene (Cumene)	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Methyl Acetate	200	U	200	4.7	20	NA	7/11/11 16:05		253085	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110707
Lab Code: R1103812-003

Service Request: R1103812
Date Collected: 7/7/11 1002
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Methylcyclohexane	200	U	200	5.0	20	NA	7/11/11 16:05		253085	
Styrene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Tetrachloroethene (PCE)	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Toluene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Trichloroethene (TCE)	330		100	4.7	20	NA	7/11/11 16:05		253085	
Trichlorofluoromethane (CFC 11)	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
Vinyl Chloride	100	U	100	4.7	20	NA	7/11/11 16:05		253085	
cis-1,2-Dichloroethene	1500		100	4.0	20	NA	7/11/11 16:05		253085	
cis-1,3-Dichloropropene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
m,p-Xylenes	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
n-Butyl Acetate	3500		100	4.2	20	NA	7/11/11 16:05		253085	
o-Xylene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	
trans-1,2-Dichloroethene	11	J	100	4.0	20	NA	7/11/11 16:05		253085	
trans-1,3-Dichloropropene	100	U	100	4.0	20	NA	7/11/11 16:05		253085	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	7/11/11 16:05	
Dibromofluoromethane	102	89-119	7/11/11 16:05	
Toluene-d8	105	87-121	7/11/11 16:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110707
Lab Code: R1103812-004

Service Request: R1103812
Date Collected: 7/ 7/11 1042
Date Received: 7/ 8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	24.1	mg/L	1.0	10	NA	7/26/11 16:09	
Iodide	300.0	14.4	mg/L	2.0	10	NA	7/13/11 01:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002C-038.5-20110707
 Lab Code: R1103812-004

Service Request: R1103812
 Date Collected: 7/7/11 1042
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 04:09		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 04:09		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	5000	U	5000	310	1000	NA	7/11/11 04:09		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 04:09		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 04:09		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 04:09		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 04:09		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
n-Butanol	120000	J	250000	11000	1000	NA	7/11/11 04:09		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 04:09		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 04:09		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 04:09		253001	
Acetone	20000	U	20000	980	1000	NA	7/11/11 04:09		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 04:09		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 04:09		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 04:09		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 04:09		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 04:09		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 04:09		253001	
Chloroform	250	J	5000	220	1000	NA	7/11/11 04:09		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 04:09		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 04:09		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 04:09		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 04:09		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 04:09		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110707
Lab Code: R1103812-004

Service Request: R1103812
Date Collected: 7/7/11 1042
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 04:09		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Trichloroethene (TCE)	2000	J	5000	230	1000	NA	7/11/11 04:09		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
Vinyl Chloride	2200	J	5000	230	1000	NA	7/11/11 04:09		253001	
cis-1,2-Dichloroethene	51000		5000	200	1000	NA	7/11/11 04:09		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
n-Butyl Acetate	490000	D	25000	1100	5000	NA	7/11/11 16:36		253085	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	
trans-1,2-Dichloroethene	360	J	5000	200	1000	NA	7/11/11 04:09		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 04:09		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/11/11 04:09	
Dibromofluoromethane	104	89-119	7/11/11 04:09	
Toluene-d8	105	87-121	7/11/11 04:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110707
Lab Code: R1103812-005

Service Request: R1103812
Date Collected: 7/7/11 1135
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.2	mg/L	1.0	10	NA	7/26/11 13:09	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 01:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002D-045.5-20110707
 Lab Code: R1103812-005

Service Request: R1103812
 Date Collected: 7/7/11 1135
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	7/11/11 17:06		253085	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,1,2-Trichloroethane	250	U	250	12	50	NA	7/11/11 17:06		253085	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	50	NA	7/11/11 17:06		253085	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,1-Dichloroethene (1,1-DCE)	250	U	250	15	50	NA	7/11/11 17:06		253085	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	7/11/11 17:06		253085	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	7/11/11 17:06		253085	
1,2-Dibromoethane	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,2-Dichlorobenzene	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,2-Dichloroethane	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,2-Dichloropropane	250	U	250	15	50	NA	7/11/11 17:06		253085	
1,3-Dichlorobenzene	250	U	250	10	50	NA	7/11/11 17:06		253085	
1,4-Dichlorobenzene	250	U	250	10	50	NA	7/11/11 17:06		253085	
n-Butanol	13000	U	13000	530	50	NA	7/11/11 17:06		253085	
2-Butanone (MEK)	500	U	500	26	50	NA	7/11/11 17:06		253085	
2-Hexanone	500	U	500	18	50	NA	7/11/11 17:06		253085	
4-Methyl-2-pentanone	500	U	500	14	50	NA	7/11/11 17:06		253085	
Acetone	1000	U	1000	49	50	NA	7/11/11 17:06		253085	
Benzene	250	U	250	11	50	NA	7/11/11 17:06		253085	
Bromodichloromethane	250	U	250	10	50	NA	7/11/11 17:06		253085	
Bromoform	250	U	250	14	50	NA	7/11/11 17:06		253085	
Bromomethane	250	U	250	16	50	NA	7/11/11 17:06		253085	
Carbon Disulfide	500	U	500	10	50	NA	7/11/11 17:06		253085	
Carbon Tetrachloride	250	U	250	14	50	NA	7/11/11 17:06		253085	
Chlorobenzene	250	U	250	10	50	NA	7/11/11 17:06		253085	
Chloroethane	250	U	250	16	50	NA	7/11/11 17:06		253085	
Chloroform	250	U	250	11	50	NA	7/11/11 17:06		253085	
Chloromethane	250	U	250	12	50	NA	7/11/11 17:06		253085	
Cyclohexane	500	U	500	12	50	NA	7/11/11 17:06		253085	
Dibromochloromethane	250	U	250	10	50	NA	7/11/11 17:06		253085	
Dichlorodifluoromethane (CFC 12)	250	U	250	29	50	NA	7/11/11 17:06		253085	
Dichloromethane	250	U	250	11	50	NA	7/11/11 17:06		253085	
Ethylbenzene	250	U	250	10	50	NA	7/11/11 17:06		253085	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	7/11/11 17:06		253085	
Methyl Acetate	500	U	500	12	50	NA	7/11/11 17:06		253085	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110707
Lab Code: R1103812-005

Service Request: R1103812
Date Collected: 7/7/11 1135
Date Received: 7/8/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	10	50	NA	7/11/11 17:06		253085	
Methylcyclohexane	500	U	500	13	50	NA	7/11/11 17:06		253085	
Styrene	250	U	250	10	50	NA	7/11/11 17:06		253085	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	7/11/11 17:06		253085	
Toluene	250	U	250	10	50	NA	7/11/11 17:06		253085	
Trichloroethene (TCE)	41	J	250	12	50	NA	7/11/11 17:06		253085	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	7/11/11 17:06		253085	
Vinyl Chloride	1300		250	12	50	NA	7/11/11 17:06		253085	
cis-1,2-Dichloroethene	8000		250	10	50	NA	7/11/11 17:06		253085	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	7/11/11 17:06		253085	
m,p-Xylenes	250	U	250	10	50	NA	7/11/11 17:06		253085	
n-Butyl Acetate	49	J	250	11	50	NA	7/11/11 17:06		253085	
o-Xylene	250	U	250	10	50	NA	7/11/11 17:06		253085	
trans-1,2-Dichloroethene	58	J	250	10	50	NA	7/11/11 17:06		253085	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	7/11/11 17:06		253085	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/11/11 17:06	
Dibromofluoromethane	108	89-119	7/11/11 17:06	
Toluene-d8	107	87-121	7/11/11 17:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110707
Lab Code: R1103812-006

Service Request: R1103812
Date Collected: 7/7/11 1110
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.5	mg/L	1.0	10	NA	7/26/11 13:23	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 01:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0002E-052.5-20110707
 Lab Code: R1103812-006

Service Request: R1103812
 Date Collected: 7/7/11 1110
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100	U	100	4.7	20	NA	7/11/11 17:37		253085	
1,1,2,2-Tetrachloroethane	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,1,2-Trichloroethane	100	U	100	4.7	20	NA	7/11/11 17:37		253085	
1,1,2-Trichloro-1,2,2-trifluoroethane	100	U	100	6.2	20	NA	7/11/11 17:37		253085	
1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,1-Dichloroethene (1,1-DCE)	100	U	100	5.8	20	NA	7/11/11 17:37		253085	
1,2,4-Trichlorobenzene	100	U	100	5.2	20	NA	7/11/11 17:37		253085	
1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	7.6	20	NA	7/11/11 17:37		253085	
1,2-Dibromoethane	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,2-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,2-Dichloroethane	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,2-Dichloropropane	100	U	100	5.7	20	NA	7/11/11 17:37		253085	
1,3-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
1,4-Dichlorobenzene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
n-Butanol	2000	J	5000	210	20	NA	7/11/11 17:37		253085	
2-Butanone (MEK)	200	U	200	11	20	NA	7/11/11 17:37		253085	
2-Hexanone	200	U	200	7.0	20	NA	7/11/11 17:37		253085	
4-Methyl-2-pentanone	200	U	200	5.4	20	NA	7/11/11 17:37		253085	
Acetone	400	U	400	20	20	NA	7/11/11 17:37		253085	
Benzene	100	U	100	4.2	20	NA	7/11/11 17:37		253085	
Bromodichloromethane	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Bromoform	100	U	100	5.4	20	NA	7/11/11 17:37		253085	
Bromomethane	100	U	100	6.2	20	NA	7/11/11 17:37		253085	
Carbon Disulfide	200	U	200	4.0	20	NA	7/11/11 17:37		253085	
Carbon Tetrachloride	100	U	100	5.4	20	NA	7/11/11 17:37		253085	
Chlorobenzene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Chloroethane	100	U	100	6.2	20	NA	7/11/11 17:37		253085	
Chloroform	100	U	100	4.4	20	NA	7/11/11 17:37		253085	
Chloromethane	100	U	100	4.8	20	NA	7/11/11 17:37		253085	
Cyclohexane	200	U	200	4.8	20	NA	7/11/11 17:37		253085	
Dibromochloromethane	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Dichlorodifluoromethane (CFC 12)	100	U	100	12	20	NA	7/11/11 17:37		253085	
Dichloromethane	100	U	100	4.4	20	NA	7/11/11 17:37		253085	
Ethylbenzene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Isopropylbenzene (Cumene)	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Methyl Acetate	200	U	200	4.7	20	NA	7/11/11 17:37		253085	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110707
Lab Code: R1103812-006

Service Request: R1103812
Date Collected: 7/ 7/11 1110
Date Received: 7/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Methylcyclohexane	200	U	200	5.0	20	NA	7/11/11 17:37		253085	
Styrene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Tetrachloroethene (PCE)	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Toluene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Trichloroethene (TCE)	100	U	100	4.7	20	NA	7/11/11 17:37		253085	
Trichlorofluoromethane (CFC 11)	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
Vinyl Chloride	100	U	100	4.7	20	NA	7/11/11 17:37		253085	
cis-1,2-Dichloroethene	62	J	100	4.0	20	NA	7/11/11 17:37		253085	
cis-1,3-Dichloropropene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
m,p-Xylenes	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
n-Butyl Acetate	3300		100	4.2	20	NA	7/11/11 17:37		253085	
o-Xylene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
trans-1,2-Dichloroethene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	
trans-1,3-Dichloropropene	100	U	100	4.0	20	NA	7/11/11 17:37		253085	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/11/11 17:37	
Dibromofluoromethane	104	89-119	7/11/11 17:37	
Toluene-d8	107	87-121	7/11/11 17:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110707
Lab Code: R1103812-007

Service Request: R1103812
Date Collected: 7/7/11 0955
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	36.1	mg/L	2.0	20	NA	7/25/11 23:03	
Iodide	300.0	58	mg/L	20	100	NA	7/12/11 21:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110707
 Lab Code: R1103812-007

Service Request: R1103812
 Date Collected: 7/7/11 0955
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 05:40		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 05:40		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	5000	U	5000	310	1000	NA	7/11/11 05:40		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 05:40		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 05:40		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 05:40		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 05:40		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
n-Butanol	360000		250000	11000	1000	NA	7/11/11 05:40		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 05:40		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 05:40		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 05:40		253001	
Acetone	20000	U	20000	980	1000	NA	7/11/11 05:40		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 05:40		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 05:40		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 05:40		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 05:40		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 05:40		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 05:40		253001	
Chloroform	5000	U	5000	220	1000	NA	7/11/11 05:40		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 05:40		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 05:40		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 05:40		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 05:40		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 05:40		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110707
Lab Code: R1103812-007

Service Request: R1103812
Date Collected: 7/7/11 0955
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 05:40		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Trichloroethene (TCE)	5000	U	5000	230	1000	NA	7/11/11 05:40		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
Vinyl Chloride	2400	J	5000	230	1000	NA	7/11/11 05:40		253001	
cis-1,2-Dichloroethene	4300	J	5000	200	1000	NA	7/11/11 05:40		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
n-Butyl Acetate	640000	D	25000	1100	5000	NA	7/11/11 18:07		253085	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 05:40		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/11/11 05:40	
Dibromofluoromethane	103	89-119	7/11/11 05:40	
Toluene-d8	106	87-121	7/11/11 05:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110707
Lab Code: R1103812-008

Service Request: R1103812
Date Collected: 7/7/11 1110
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	23.5	mg/L	2.0	20	NA	7/25/11 23:17	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 01:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003D-045.5-20110707
 Lab Code: R1103812-008

Service Request: R1103812
 Date Collected: 7/7/11 1110
 Date Received: 7/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 06:10		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 06:10		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	420	J	5000	310	1000	NA	7/11/11 06:10		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 06:10		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 06:10		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 06:10		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 06:10		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
n-Butanol	350000		250000	11000	1000	NA	7/11/11 06:10		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 06:10		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 06:10		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 06:10		253001	
Acetone	20000	U	20000	980	1000	NA	7/11/11 06:10		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 06:10		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 06:10		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 06:10		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 06:10		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 06:10		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 06:10		253001	
Chloroform	5000	U	5000	220	1000	NA	7/11/11 06:10		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 06:10		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 06:10		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 06:10		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 06:10		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 06:10		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110707
Lab Code: R1103812-008

Service Request: R1103812
Date Collected: 7/7/11 1110
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 06:10		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Trichloroethene (TCE)	1300	J	5000	230	1000	NA	7/11/11 06:10		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
Vinyl Chloride	400	J	5000	230	1000	NA	7/11/11 06:10		253001	
cis-1,2-Dichloroethene	7700		5000	200	1000	NA	7/11/11 06:10		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
n-Butyl Acetate	830000	D	25000	1100	5000	NA	7/11/11 18:37		253085	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 06:10		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/11/11 06:10	
Dibromofluoromethane	105	89-119	7/11/11 06:10	
Toluene-d8	106	87-121	7/11/11 06:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110707
Lab Code: R1103812-009

Service Request: R1103812
Date Collected: 7/ 7/11 1045
Date Received: 7/ 8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	44.5	mg/L	2.0	20	NA	7/25/11 23:31	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 02:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-BW0003E-052.5-20110707
 Lab Code: R1103812-009

Service Request: R1103812
 Date Collected: 7/7/11 1045
 Date Received: 7/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	7/11/11 06:40		253001	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	7/11/11 06:40		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	560	J	5000	310	1000	NA	7/11/11 06:40		253001	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	7/11/11 06:40		253001	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	7/11/11 06:40		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	7/11/11 06:40		253001	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	7/11/11 06:40		253001	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
n-Butanol	520000		250000	11000	1000	NA	7/11/11 06:40		253001	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	7/11/11 06:40		253001	
2-Hexanone	10000	U	10000	350	1000	NA	7/11/11 06:40		253001	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	7/11/11 06:40		253001	
Acetone	20000	U	20000	980	1000	NA	7/11/11 06:40		253001	
Benzene	5000	U	5000	210	1000	NA	7/11/11 06:40		253001	
Bromodichloromethane	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Bromoform	5000	U	5000	270	1000	NA	7/11/11 06:40		253001	
Bromomethane	5000	U	5000	310	1000	NA	7/11/11 06:40		253001	
Carbon Disulfide	10000	U	10000	200	1000	NA	7/11/11 06:40		253001	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	7/11/11 06:40		253001	
Chlorobenzene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Chloroethane	5000	U	5000	310	1000	NA	7/11/11 06:40		253001	
Chloroform	5000	U	5000	220	1000	NA	7/11/11 06:40		253001	
Chloromethane	5000	U	5000	240	1000	NA	7/11/11 06:40		253001	
Cyclohexane	10000	U	10000	240	1000	NA	7/11/11 06:40		253001	
Dibromochloromethane	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	7/11/11 06:40		253001	
Dichloromethane	5000	U	5000	220	1000	NA	7/11/11 06:40		253001	
Ethylbenzene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Methyl Acetate	10000	U	10000	230	1000	NA	7/11/11 06:40		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110707
Lab Code: R1103812-009

Service Request: R1103812
Date Collected: 7/7/11 1045
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Methylcyclohexane	10000	U	10000	250	1000	NA	7/11/11 06:40		253001	
Styrene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Toluene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Trichloroethene (TCE)	980	J	5000	230	1000	NA	7/11/11 06:40		253001	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
Vinyl Chloride	5000	U	5000	230	1000	NA	7/11/11 06:40		253001	
cis-1,2-Dichloroethene	1300	J	5000	200	1000	NA	7/11/11 06:40		253001	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
m,p-Xylenes	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
n-Butyl Acetate	1500000	D	50000	2100	10000	NA	7/11/11 19:08		253085	
o-Xylene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	7/11/11 06:40		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/11/11 06:40	
Dibromofluoromethane	103	89-119	7/11/11 06:40	
Toluene-d8	107	87-121	7/11/11 06:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110707
Lab Code: R1103812-010

Service Request: R1103812
Date Collected: 7/7/11 0930
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	17.4	mg/L	1.0	10	NA	7/26/11 15:00	
Iodide	300.0	2.1	mg/L	2.0	10	NA	7/13/11 02:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110707
 Lab Code: R1103812-010

Service Request: R1103812
 Date Collected: 7/7/11 0930
 Date Received: 7/8/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	46	200	NA	7/11/11 07:11		253001	
1,1,2,2-Tetrachloroethane	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,1,2-Trichloroethane	1000	U	1000	46	200	NA	7/11/11 07:11		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	13000		1000	62	200	NA	7/11/11 07:11		253001	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	200	NA	7/11/11 07:11		253001	
1,2,4-Trichlorobenzene	1000	U	1000	52	200	NA	7/11/11 07:11		253001	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	200	NA	7/11/11 07:11		253001	
1,2-Dibromoethane	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,2-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,2-Dichloroethane	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,2-Dichloropropane	1000	U	1000	57	200	NA	7/11/11 07:11		253001	
1,3-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
1,4-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
n-Butanol	140000		50000	2100	200	NA	7/11/11 07:11		253001	
2-Butanone (MEK)	2000	U	2000	110	200	NA	7/11/11 07:11		253001	
2-Hexanone	2000	U	2000	70	200	NA	7/11/11 07:11		253001	
4-Methyl-2-pentanone	2000	U	2000	54	200	NA	7/11/11 07:11		253001	
Acetone	4000	U	4000	200	200	NA	7/11/11 07:11		253001	
Benzene	1000	U	1000	42	200	NA	7/11/11 07:11		253001	
Bromodichloromethane	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Bromoform	1000	U	1000	54	200	NA	7/11/11 07:11		253001	
Bromomethane	1000	U	1000	62	200	NA	7/11/11 07:11		253001	
Carbon Disulfide	2000	U	2000	40	200	NA	7/11/11 07:11		253001	
Carbon Tetrachloride	1000	U	1000	54	200	NA	7/11/11 07:11		253001	
Chlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Chloroethane	1000	U	1000	62	200	NA	7/11/11 07:11		253001	
Chloroform	1000	U	1000	44	200	NA	7/11/11 07:11		253001	
Chloromethane	1000	U	1000	48	200	NA	7/11/11 07:11		253001	
Cyclohexane	2000	U	2000	48	200	NA	7/11/11 07:11		253001	
Dibromochloromethane	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	200	NA	7/11/11 07:11		253001	
Dichloromethane	1000	U	1000	44	200	NA	7/11/11 07:11		253001	
Ethylbenzene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Isopropylbenzene (Cumene)	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Methyl Acetate	82	J	2000	46	200	NA	7/11/11 07:11		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110707
Lab Code: R1103812-010

Service Request: R1103812
Date Collected: 7/ 7/11 0930
Date Received: 7/ 8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Methylcyclohexane	2000	U	2000	50	200	NA	7/11/11 07:11		253001	
Styrene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Tetrachloroethene (PCE)	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Toluene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Trichloroethene (TCE)	21000		1000	46	200	NA	7/11/11 07:11		253001	
Trichlorofluoromethane (CFC 11)	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
Vinyl Chloride	690	J	1000	46	200	NA	7/11/11 07:11		253001	
cis-1,2-Dichloroethene	20000		1000	40	200	NA	7/11/11 07:11		253001	
cis-1,3-Dichloropropene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
m,p-Xylenes	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
n-Butyl Acetate	410000	D	13000	530	2500	NA	7/12/11 18:38		253196	
o-Xylene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	
trans-1,2-Dichloroethene	150	J	1000	40	200	NA	7/11/11 07:11		253001	
trans-1,3-Dichloropropene	1000	U	1000	40	200	NA	7/11/11 07:11		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	7/11/11 07:11	
Dibromofluoromethane	106	89-119	7/11/11 07:11	
Toluene-d8	106	87-121	7/11/11 07:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110707
Lab Code: R1103812-011

Service Request: R1103812
Date Collected: 7/7/11 0905
Date Received: 7/8/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	4.8	mg/L	1.0	10	NA	7/26/11 14:18	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	7/13/11 02:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110707
 Lab Code: R1103812-011

Service Request: R1103812
 Date Collected: 7/7/11 0905
 Date Received: 7/8/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	1000	U	1000	46	200	NA	7/11/11 07:41		253001	
1,1,2,2-Tetrachloroethane	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,1,2-Trichloroethane	1000	U	1000	46	200	NA	7/11/11 07:41		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	1000	U	1000	62	200	NA	7/11/11 07:41		253001	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	200	NA	7/11/11 07:41		253001	
1,2,4-Trichlorobenzene	1000	U	1000	52	200	NA	7/11/11 07:41		253001	
1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	200	NA	7/11/11 07:41		253001	
1,2-Dibromoethane	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,2-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,2-Dichloroethane	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,2-Dichloropropane	1000	U	1000	57	200	NA	7/11/11 07:41		253001	
1,3-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
1,4-Dichlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
n-Butanol	8700	J	50000	2100	200	NA	7/11/11 07:41		253001	
2-Butanone (MEK)	2000	U	2000	110	200	NA	7/11/11 07:41		253001	
2-Hexanone	2000	U	2000	70	200	NA	7/11/11 07:41		253001	
4-Methyl-2-pentanone	2000	U	2000	54	200	NA	7/11/11 07:41		253001	
Acetone	4000	U	4000	200	200	NA	7/11/11 07:41		253001	
Benzene	1000	U	1000	42	200	NA	7/11/11 07:41		253001	
Bromodichloromethane	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Bromoform	1000	U	1000	54	200	NA	7/11/11 07:41		253001	
Bromomethane	1000	U	1000	62	200	NA	7/11/11 07:41		253001	
Carbon Disulfide	2000	U	2000	40	200	NA	7/11/11 07:41		253001	
Carbon Tetrachloride	1000	U	1000	54	200	NA	7/11/11 07:41		253001	
Chlorobenzene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Chloroethane	1000	U	1000	62	200	NA	7/11/11 07:41		253001	
Chloroform	1000	U	1000	44	200	NA	7/11/11 07:41		253001	
Chloromethane	1000	U	1000	48	200	NA	7/11/11 07:41		253001	
Cyclohexane	2000	U	2000	48	200	NA	7/11/11 07:41		253001	
Dibromochloromethane	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	200	NA	7/11/11 07:41		253001	
Dichloromethane	1000	U	1000	44	200	NA	7/11/11 07:41		253001	
Ethylbenzene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Isopropylbenzene (Cumene)	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Methyl Acetate	2000	U	2000	46	200	NA	7/11/11 07:41		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110707
Lab Code: R1103812-011

Service Request: R1103812
Date Collected: 7/7/11 0905
Date Received: 7/8/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Methylcyclohexane	2000	U	2000	50	200	NA	7/11/11 07:41		253001	
Styrene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Tetrachloroethene (PCE)	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Toluene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Trichloroethene (TCE)	1100		1000	46	200	NA	7/11/11 07:41		253001	
Trichlorofluoromethane (CFC 11)	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
Vinyl Chloride	140	J	1000	46	200	NA	7/11/11 07:41		253001	
cis-1,2-Dichloroethene	4000		1000	40	200	NA	7/11/11 07:41		253001	
cis-1,3-Dichloropropene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
m,p-Xylenes	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
n-Butyl Acetate	81000	D	2500	110	500	NA	7/11/11 20:09		253085	
o-Xylene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
trans-1,2-Dichloroethene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	
trans-1,3-Dichloropropene	1000	U	1000	40	200	NA	7/11/11 07:41		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/11/11 07:41	
Dibromofluoromethane	104	89-119	7/11/11 07:41	
Toluene-d8	107	87-121	7/11/11 07:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103812-MB1

Service Request: R1103812
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U mg/L	0.10	1	NA	7/25/11 21:13	
Iodide	300.0	0.20	U mg/L	0.20	1	NA	7/12/11 17:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103812-MB2

Service Request: R1103812
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	7/26/11 10:40	
Iodide	300.0	0.20 U	mg/L	0.20	1	NA	7/12/11 21:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1103812-MB3

Service Request: R1103812
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Iodide	300.0	0.20 U	mg/L	0.20	1	NA	7/13/11 00:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106692-04

Service Request: R1103812
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253001

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/10/11 23:35		253001	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/10/11 23:35		253001	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/10/11 23:35		253001	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/10/11 23:35		253001	
1,2,4-Trichlorobenzene	0.31	J	5.0	0.26	1	NA	7/10/11 23:35		253001	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/10/11 23:35		253001	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/10/11 23:35		253001	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
n-Butanol	250	U	250	11	1	NA	7/10/11 23:35		253001	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/10/11 23:35		253001	
2-Hexanone	10	U	10	0.35	1	NA	7/10/11 23:35		253001	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/10/11 23:35		253001	
Acetone	20	U	20	0.98	1	NA	7/10/11 23:35		253001	
Benzene	5.0	U	5.0	0.21	1	NA	7/10/11 23:35		253001	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Bromoform	5.0	U	5.0	0.27	1	NA	7/10/11 23:35		253001	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/10/11 23:35		253001	
Carbon Disulfide	10	U	10	0.20	1	NA	7/10/11 23:35		253001	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/10/11 23:35		253001	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/10/11 23:35		253001	
Chloroform	5.0	U	5.0	0.22	1	NA	7/10/11 23:35		253001	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/10/11 23:35		253001	
Cyclohexane	10	U	10	0.24	1	NA	7/10/11 23:35		253001	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/10/11 23:35		253001	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/10/11 23:35		253001	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Methyl Acetate	10	U	10	0.23	1	NA	7/10/11 23:35		253001	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106692-04

Service Request: R1103812
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253001

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Methylcyclohexane	10	U	10	0.25	1	NA	7/10/11 23:35		253001	
Styrene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Toluene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/10/11 23:35		253001	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/10/11 23:35		253001	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/10/11 23:35		253001	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/10/11 23:35		253001	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/10/11 23:35	
Dibromofluoromethane	103	89-119	7/10/11 23:35	
Toluene-d8	104	87-121	7/10/11 23:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1106755-04

Service Request: R1103812
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/11/11 12:44		253085	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/11/11 12:44		253085	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/11/11 12:44		253085	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/11/11 12:44		253085	
1,2,4-Trichlorobenzene	0.35	J	5.0	0.26	1	NA	7/11/11 12:44		253085	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/11/11 12:44		253085	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/11/11 12:44		253085	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
n-Butanol	250	U	250	11	1	NA	7/11/11 12:44		253085	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/11/11 12:44		253085	
2-Hexanone	10	U	10	0.35	1	NA	7/11/11 12:44		253085	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/11/11 12:44		253085	
Acetone	1.0	J	20	0.98	1	NA	7/11/11 12:44		253085	
Benzene	5.0	U	5.0	0.21	1	NA	7/11/11 12:44		253085	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Bromoform	5.0	U	5.0	0.27	1	NA	7/11/11 12:44		253085	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/11/11 12:44		253085	
Carbon Disulfide	10	U	10	0.20	1	NA	7/11/11 12:44		253085	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/11/11 12:44		253085	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/11/11 12:44		253085	
Chloroform	0.46	J	5.0	0.22	1	NA	7/11/11 12:44		253085	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/11/11 12:44		253085	
Cyclohexane	10	U	10	0.24	1	NA	7/11/11 12:44		253085	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/11/11 12:44		253085	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/11/11 12:44		253085	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Methyl Acetate	10	U	10	0.23	1	NA	7/11/11 12:44		253085	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1106755-04

Service Request: R1103812
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analysis Lot: 253085

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Methylcyclohexane	10	U	10	0.25	1	NA	7/11/11 12:44		253085	
Styrene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Toluene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/11/11 12:44		253085	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/11/11 12:44		253085	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/11/11 12:44		253085	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/11/11 12:44		253085	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	7/11/11 12:44	
Dibromofluoromethane	106	89-119	7/11/11 12:44	
Toluene-d8	106	87-121	7/11/11 12:44	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/12/11 -
7/25/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1103812-LCS1			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.07	1.00	107	90 - 110
Iodide	300.0	0.958	1.00	96	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/12/11 -
7/26/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1103812-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.02	1.00	102	90 - 110
Iodide	300.0	0.966	1.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/13/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1103812-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Iodide	300.0	0.988	1.00	99	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/10/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 253001

**Lab Control Sample
 RQ1106692-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	15.9	20.0	79	72 - 128
1,1,2,2-Tetrachloroethane	18.1	20.0	91	72 - 131
1,1,2-Trichloroethane	19.9	20.0	99	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.8	20.0	89	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.2	20.0	91	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.0	20.0	90	72 - 129
1,2,4-Trichlorobenzene	21.0	20.0	105	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	23.7	20.0	119	62 - 131
1,2-Dibromoethane	19.9	20.0	99	78 - 125
1,2-Dichlorobenzene	19.0	20.0	95	79 - 124
1,2-Dichloroethane	16.1	20.0	81	73 - 127
1,2-Dichloropropane	18.4	20.0	92	80 - 123
1,3-Dichlorobenzene	19.4	20.0	97	78 - 124
1,4-Dichlorobenzene	19.0	20.0	95	78 - 123
n-Butanol	1190	1000	119	70 - 130
2-Butanone (MEK)	23.5	20.0	118	60 - 133
2-Hexanone	21.6	20.0	108	61 - 131
4-Methyl-2-pentanone	21.2	20.0	106	61 - 132
Acetone	23.3	20.0	116	54 - 139
Benzene	18.1	20.0	90	78 - 121
Bromodichloromethane	18.0	20.0	90	80 - 125
Bromoform	21.4	20.0	107	68 - 130
Bromomethane	19.5	20.0	97	57 - 144
Carbon Disulfide	18.0	20.0	90	52 - 140
Carbon Tetrachloride	17.3	20.0	87	68 - 133
Chlorobenzene	19.1	20.0	95	80 - 121
Chloroethane	19.4	20.0	97	71 - 130
Chloroform	16.4	20.0	82	78 - 125
Chloromethane	20.6	20.0	103	61 - 138
Cyclohexane	17.7	20.0	89	57 - 126
Dibromochloromethane	20.3	20.0	102	78 - 133
Dichlorodifluoromethane (CFC 12)	19.7	20.0	99	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/10/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 253001

**Lab Control Sample
 RQ1106692-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.6	20.0	93	75 - 125
Ethylbenzene	18.2	20.0	91	78 - 123
Isopropylbenzene (Cumene)	20.9	20.0	104	73 - 133
Methyl Acetate	18.2	20.0	91	57 - 157
Methyl tert-Butyl Ether	18.4	20.0	92	75 - 126
Methylcyclohexane	18.9	20.0	95	61 - 125
Styrene	19.1	20.0	95	80 - 132
Tetrachloroethene (PCE)	19.3	20.0	97	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	20.7	20.0	104	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	69 - 141
Vinyl Chloride	20.9	20.0	105	72 - 138
cis-1,2-Dichloroethene	17.9	20.0	89	78 - 122
cis-1,3-Dichloropropene	17.3	20.0	87	77 - 125
m,p-Xylenes	38.5	40.0	96	79 - 126
n-Butyl Acetate	19.9	20.0	100	31 - 144
o-Xylene	18.5	20.0	93	77 - 118
trans-1,2-Dichloroethene	18.2	20.0	91	75 - 121
trans-1,3-Dichloropropene	17.6	20.0	88	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/11/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA
Analysis Lot: 253085

**Lab Control Sample
 RQ1106755-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.2	20.0	91	72 - 128
1,1,2,2-Tetrachloroethane	21.4	20.0	107	72 - 131
1,1,2-Trichloroethane	22.0	20.0	110	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.5	20.0	102	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.1	20.0	105	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.7	20.0	104	72 - 129
1,2,4-Trichlorobenzene	23.7	20.0	118	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	23.4	20.0	117	62 - 131
1,2-Dibromoethane	20.8	20.0	104	78 - 125
1,2-Dichlorobenzene	21.5	20.0	107	79 - 124
1,2-Dichloroethane	17.9	20.0	90	73 - 127
1,2-Dichloropropane	21.2	20.0	106	80 - 123
1,3-Dichlorobenzene	22.4	20.0	112	78 - 124
1,4-Dichlorobenzene	21.6	20.0	108	78 - 123
n-Butanol	1180	1000	117	70 - 130
2-Butanone (MEK)	22.3	20.0	111	60 - 133
2-Hexanone	20.7	20.0	103	61 - 131
4-Methyl-2-pentanone	22.2	20.0	111	61 - 132
Acetone	23.1	20.0	115	54 - 139
Benzene	21.2	20.0	106	78 - 121
Bromodichloromethane	20.4	20.0	102	80 - 125
Bromoform	23.2	20.0	116	68 - 130
Bromomethane	22.6	20.0	113	57 - 144
Carbon Disulfide	25.8	20.0	129	52 - 140
Carbon Tetrachloride	18.3	20.0	91	68 - 133
Chlorobenzene	21.6	20.0	108	80 - 121
Chloroethane	21.8	20.0	109	71 - 130
Chloroform	19.0	20.0	95	78 - 125
Chloromethane	24.0	20.0	120	61 - 138
Cyclohexane	20.5	20.0	103	57 - 126
Dibromochloromethane	22.5	20.0	113	78 - 133
Dichlorodifluoromethane (CFC 12)	22.4	20.0	112	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1103812
Date Analyzed: 7/11/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 253085

**Lab Control Sample
 RQ1106755-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.9	20.0	110	75 - 125
Ethylbenzene	21.2	20.0	106	78 - 123
Isopropylbenzene (Cumene)	24.4	20.0	122	73 - 133
Methyl Acetate	19.1	20.0	95	57 - 157
Methyl tert-Butyl Ether	20.1	20.0	100	75 - 126
Methylcyclohexane	23.5	20.0	117	61 - 125
Styrene	21.9	20.0	109	80 - 132
Tetrachloroethene (PCE)	21.3	20.0	106	72 - 131
Toluene	20.6	20.0	103	78 - 122
Trichloroethene (TCE)	21.4	20.0	107	74 - 127
Trichlorofluoromethane (CFC 11)	19.7	20.0	99	69 - 141
Vinyl Chloride	23.7	20.0	119	72 - 138
cis-1,2-Dichloroethene	21.1	20.0	105	78 - 122
cis-1,3-Dichloropropene	20.2	20.0	101	77 - 125
m,p-Xylenes	44.1	40.0	110	79 - 126
n-Butyl Acetate	20.9	20.0	104	31 - 144
o-Xylene	21.1	20.0	106	77 - 118
trans-1,2-Dichloroethene	20.5	20.0	103	75 - 121
trans-1,3-Dichloropropene	20.4	20.0	102	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate (300.0)	Bromide and Iodide (300.0)	REMARKS
LC34-BW0001C-038.5-20110707	7/7/2011	0900	-001	GW	4	3	1	
LC34-BW0001D-045.5-20110707	7/7/2011	0932	-002	GW	4	3	1	
LC34-BW0001E-052.5-20110707	7/7/2011	1002	-003	GW	4	3	1	
LC34-BW0002C-038.5-20110707	7/7/2011	1042	-004	GW	4	3	1	
LC34-BW0002D-045.5-20110707	7/7/2011	1135	-005	GW	4	3	1	
LC34-BW0002E-052.5-20110707	7/7/2011	1110	-006	GW	4	3	1	
LC34-BW0003C-038.5-20110707	7/7/2011	0955	-007	GW	4	3	1	
LC34-BW0003D-045.5-20110707	7/7/2011	1020	-008	GW	4	3	1	
LC34-BW0003E-052.5-20110707	7/7/2011	1045	-009	GW	4	3	1	
LC34-RW0007-038.5-20110707	7/7/2011	0930	-010	GW	4	3	1	
LC34-RW0008-052.0-20110707	7/7/2011	0905	-011	GW	4	3	1	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD


Invoice Information
 P.O. # _____
 Bill to: TR0272

Comments/Special Instructions:
 * Corrected chain sent: 11:10 B3 71811

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Spavett
 Firm: Geosyntec
 Date/Time: 7/7/11 1600

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Christine M. Leator
 Firm: CAS
 Date/Time: 7/8/11 0930

R1103812
 Geosyntec Consultants
 ESTCP PED LC34 TR0272



Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R11-3812

Cooler received on 7/8/11 by: cnk COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.0°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 7/8/11 0948
 Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 8/3/11

Cooler Breakdown: Date: 7/8/11 Time: 1146 by: DLW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis -- pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 053011-2v, 0-314-005
 Other Comments: _____

C Secondary Review: KB 8/3/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

August 31, 2011

Service Request No: R1104260

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC24 TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 2, 2011. For your reference, these analyses have been assigned our service request number **R1104260**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1104260
Date Received: 8/2/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-nine (29) water samples were collected by the client on 8/1/11 and were received for analysis at Columbia Analytical Services on 8/2/11 via a national courier. The samples were received at a cooler temperature range of 2.5-4.0°C within the guidelines of 0-6°C. Bubbles were noted in several VOC vials, however in each case at least 1 of the 3 vials for each sample was bubble free. Six samples for Sulfide and Alkalinity also contained bubbles in the bottles. All are noted on the Cooler Receipt and Preservation Check Form at the end of the report. Location LC34-BW0001C-038.5-20110801 (R1104260-017) requested RSK-175, however no vials were received for this location for this analysis. A VOC vial was used to run this analysis.

Organic Compounds

Nineteen (19) water samples including one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Fourteen (14) samples were also analyzed for Organic Acids by HPLC. Thirteen (13) locations were analyzed for GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except the Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Bromomethane on the 8/4/11 analytical run and 1,2,4-Trichlorobenzene (32.2%) and MEK (-22.5%) on the 8/5/11 run. All detected concentrations for these compounds in samples associated with these CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Site specific QC is included in the report for locations LC34-IW0002D1-052.5-20110801 (CAS #R1104260-009) for 8260C, LC34-IW0002I-027.5-20110801 (CAS # R1104260-005) for Organic Acids, and LC34-IW0002D-037.5-2011080 (CAS #R1104260-007) for RSK-175. All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within limits except for 1,2,4-Trichlorobenzene (outside limits high) and cis-1,2-Dichloroethene. All Relative Percent Difference (RPD) calculations were acceptable. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK & Organic Acids) recoveries were all within QC limits except for 1,2,4-Trichlorobenzene which was outside limits high on the 8/5/11 run. The exceedences have been flagged as “*”. The Acetic Acid and Butanoic Acid recoveries are flagged as “#”. The sample was spiked too low for these compounds (<4X the concentration in the sample) to accurately determine the recoveries.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as “J”, estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as “D”. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were initially analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. The RSK-175 samples were analyzed within 14 days of collection for preserved samples. Location -017 was analyzed out of the holding time for unpreserved samples since a VOC vial was used for this analysis as noted above. Organic Acids were analyzed within the proper holding time.

Approved by Karen Bunker Date 9/1/11

The Laboratory Method Blanks were free from contamination except for Acetone which contained a low level hit on the 8/5/11 13:34 analytical run and n-Butanol on the 8/5/11 12:11 run. Any affected data is flagged as "B" in the report.

For the RSK analysis, there was a slight shift in Retention Time (RT) and poor peak shape (very broad instead of Gaussian) for ethane during the analysis of these samples. It appears that coelution is occurring, but we don't have the ability to differentiate between ethane and the co-eluting compound. The Ethane results may be biased high.

The Primary Standard mix for RSK expired on 8/6/11. The Secondary Standard mix expired on 8/9/11. Both standards have shown little to no degradation over the past year. New standards have been ordered but not yet received.

No other analytical or QC problems were encountered.

Inorganic Parameters

Fourteen (14) water samples were analyzed for Bromide and Iodide by IC method 300.0 and dissolved ICP Metals. Thirteen (13) samples were analyzed for TOC by method 9060A. Twelve (12) of the samples were analyzed for Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Site QC is included in the report for locations LC34-RW0008-052.0-20110801 (CAS #R1104260-003) TOC, LC34-BW0001E-052.5-20110801 (CAS #R1104260-021) Iodide and Alkalinity, and LC34-BW0001F-059.5-20110801 (CAS# R1104260-023) Anions and LC34-BW0001B-031.5-20110801 (CAS #R1104260-016) Dissolved Metals. All Matrix Spike (MS) recoveries were within QC acceptance limits. All Relative Percent Difference (RPD) calculations were acceptable. All Laboratory Control Sample (LCS) recoveries were within QC limits.

All holding times were met for these analyses for the initial analysis. Eleven (11) Nitrite samples required reanalysis due to high Chloride concentrations which caused interferences on the initial run. The samples were repeated outside the 48 hour holding time ranging from approximately 1-10 hours. The affected sample data is flagged as "**".

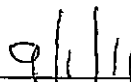
All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104260

<u>Lab ID</u>	<u>Client ID</u>
R1104260-001	LC34-RW0007-038.5-20110801
R1104260-002	LC34-RW0007-038.5-20110801 Dissolved
R1104260-003	LC34-RW0008-052.0-20110801
R1104260-004	LC34-RW0008-052.0-20110801 Dissolved
R1104260-005	LC34-IW0002I-027.5-20110801
R1104260-006	LC34-IW0002I-027.5-20110801 Dissolved
R1104260-007	LC34-IW0002D-037.5-20110801
R1104260-008	LC34-IW0002D-037.5-20110801 Dissolved
R1104260-009	LC34-IW0002D1-052.5-20110801
R1104260-010	LC34-IW0002D1-052.5-20110801 Dissolved
R1104260-011	LC34-IW0076-075.0-20110801
R1104260-012	LC34-IW0076-075.0-20110801 Dissolved
R1104260-013	LC34-BW0001A-024.5-20110801
R1104260-014	LC34-BW0001A-024.5-20110801 Dissolved
R1104260-015	LC34-BW0001B-031.5-20110801
R1104260-016	LC34-BW0001B-031.5-20110801 Dissolved
R1104260-017	LC34-BW0001C-038.5-20110801
R1104260-018	LC34-BW0001C-038.5-20110801 Dissolved
R1104260-019	LC34-BW0001D-045.5-20110801
R1104260-020	LC34-BW0001D-045.5-20110801 Dissolved
R1104260-021	LC34-BW0001E-052.5-20110801
R1104260-022	LC34-BW0001E-052.5-20110801 Dissolved
R1104260-023	LC34-BW0001F-059.5-20110801
R1104260-024	LC34-BW0001F-059.5-20110801 Dissolved
R1104260-025	LC34-RW0007-038.5-20110801-D
R1104260-026	LC34-IW0002I-027.5-20110801-D
R1104260-027	LC34-IW0002D-037.5-20110801-D
R1104260-028	LC34-BW0001B-031.5-20110801-D
R1104260-029	LC34-BW0001D-045.5-20110801-D
R1104260-030	LC34-RW0008-052.0-20110801-D
R1104260-031	LC34-IW0002D1-052.5-20110801-D
R1104260-032	LC34-IW0002D1-052.5-20110801-D Dissolved
R1104260-033	LC34-FD-20110801-01
R1104260-034	LC34-FD-20110801-03
R1104260-035	LC34-FD-20110801-04
R1104260-036	LC34-FD-20110801-05
R1104260-037	LC34-FD-20110801-06
R1104260-038	LC34-FD-20110801-09
R1104260-039	LC34-FD-20110801-02
R1104260-040	LC34-FD-20110801-07
R1104260-041	LC34-FD-20110801-08 Dissolved
R1104260-042	LC34-TB-20110801

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110801
Lab Code: R1104260-001

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	510	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	27.7	mg/L	1.0	10	NA	8/2/11 13:45	
Carbon, Total Organic (TOC), Average	9060A	327	mg/L	20	20	NA	8/11/11 18:30	
Chloride	300.0	519	mg/L	20	100	NA	8/3/11 13:43	
Iodide	300.0	2.3	mg/L	2.0	10	NA	8/16/11 11:28	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 13:45	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	8/3/11 13:43	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/2/11 13:45	
Sulfide, Total	SM 4500-S2- F	1.7	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110801 Dissolved
Lab Code: R1104260-002

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:05	
Iron, Dissolved	6010C	880	µg/L	100	1	8/ 7/11	8/13/11 02:05	
Manganese, Dissolved	6010C	91	µg/L	10	1	8/ 7/11	8/13/11 02:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1052
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 13:24

Sample Name: LC34-RW0007-038.5-20110801
 Lab Code: R1104260-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2623.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 250

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300 U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300 U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300 U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2900	1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300 U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300 U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300 U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300 U	1300	95	
106-93-4	1,2-Dibromoethane	1300 U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300 U	1300	50	
107-06-2	1,2-Dichloroethane	1300 U	1300	50	
78-87-5	1,2-Dichloropropane	1300 U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300 U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300 U	1300	50	
71-36-3	n-Butanol	180000	63000	2700	
78-93-3	2-Butanone (MEK)	2500 U	2500	130	
591-78-6	2-Hexanone	2500 U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500 U	2500	68	
67-64-1	Acetone	5000 U	5000	250	
71-43-2	Benzene	1300 U	1300	53	
75-27-4	Bromodichloromethane	1300 U	1300	50	
75-25-2	Bromoform	1300 U	1300	68	
74-83-9	Bromomethane	1300 U	1300	78	
75-15-0	Carbon Disulfide	2500 U	2500	50	
56-23-5	Carbon Tetrachloride	1300 U	1300	68	
108-90-7	Chlorobenzene	1300 U	1300	50	
75-00-3	Chloroethane	1300 U	1300	78	
67-66-3	Chloroform	1300 U	1300	55	
74-87-3	Chloromethane	1300 U	1300	60	
110-82-7	Cyclohexane	2500 U	2500	60	
124-48-1	Dibromochloromethane	1300 U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300 U	1300	140	
75-09-2	Dichloromethane	1300 U	1300	55	
100-41-4	Ethylbenzene	1300 U	1300	50	
98-82-8	Isopropylbenzene (Cumene)	1300 U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 13:24

Sample Name: LC34-RW0007-038.5-20110801
Lab Code: R1104260-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2623.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 250

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2500 U	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300 U	1300	50	
108-87-2	Methylcyclohexane	2500 U	2500	63	
100-42-5	Styrene	1300 U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300 U	1300	50	
108-88-3	Toluene	1300 U	1300	50	
79-01-6	Trichloroethene (TCE)	2400	1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300 U	1300	50	
75-01-4	Vinyl Chloride	770 J	1300	58	
156-59-2	cis-1,2-Dichloroethene	31000	1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300 U	1300	50	
179601-23-1	m,p-Xylenes	1300 U	1300	50	
123-86-4	n-Butyl Acetate	1300 U	1300	53	
95-47-6	o-Xylene	1300 U	1300	50	
156-60-5	trans-1,2-Dichloroethene	130 J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300 U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/5/11 13:24	
Dibromofluoromethane	104	89-119	8/5/11 13:24	
Toluene-d8	107	87-121	8/5/11 13:24	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 13:36

Sample Name: LC34-RW0007-038.5-20110801
Lab Code: R1104260-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star795.run

Analysis Lot: 257087
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	61		1.0	
74-85-1	Ethene	9.8		1.0	
74-82-8	Methane	35		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11
Date Analyzed: 8/15/11 22:27

Sample Name: LC34-RW0007-038.5-20110801
Lab Code: R1104260-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006086.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	350	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	230	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	5.2	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110801
Lab Code: R1104260-003

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	279	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	4.8	mg/L	1.0	10	NA	8/2/11 16:17	
Carbon, Total Organic (TOC), Average	9060A	73.1	mg/L	5.0	5	NA	8/9/11 19:20	
Chloride	300.0	602	mg/L	40	200	NA	8/3/11 16:48	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 11:37	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 16:17	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	8/3/11 16:48	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/2/11 16:17	
Sulfide, Total	SM 4500-S2- F	2.9	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110801 Dissolved
Lab Code: R1104260-004

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 02:23	
Iron, Dissolved	6010C	690		µg/L	100	1	8/ 7/11	8/13/11 02:23	
Manganese, Dissolved	6010C	86		µg/L	10	1	8/ 7/11	8/13/11 02:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110801
 Lab Code: R1104260-003

Service Request: R1104260
 Date Collected: 8/ 1/11 0954
 Date Received: 8/ 2/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/5/11 12:47		256234	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/5/11 12:47		256234	
1,1,2-Trichloro-1,2,2-trifluoroethane	3.2	J	5.0	0.31	1	NA	8/5/11 12:47		256234	
1,1-Dichloroethane (1,1-DCA)	1.0	J	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,1-Dichloroethene (1,1-DCE)	0.30	J	5.0	0.29	1	NA	8/5/11 12:47		256234	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/5/11 12:47		256234	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/5/11 12:47		256234	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/5/11 12:47		256234	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
n-Butanol	63	BJ	250	11	1	NA	8/5/11 12:47		256234	
2-Butanone (MEK)	10	U	10	0.51	1	NA	8/5/11 12:47		256234	
2-Hexanone	10	U	10	0.35	1	NA	8/5/11 12:47		256234	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/5/11 12:47		256234	
Acetone	1.8	J	20	0.98	1	NA	8/5/11 12:47		256234	
Benzene	5.0	U	5.0	0.21	1	NA	8/5/11 12:47		256234	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Bromoform	5.0	U	5.0	0.27	1	NA	8/5/11 12:47		256234	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/5/11 12:47		256234	
Carbon Disulfide	4.5	J	10	0.20	1	NA	8/5/11 12:47		256234	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/5/11 12:47		256234	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/5/11 12:47		256234	
Chloroform	5.0	U	5.0	0.22	1	NA	8/5/11 12:47		256234	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/5/11 12:47		256234	
Cyclohexane	10	U	10	0.24	1	NA	8/5/11 12:47		256234	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/5/11 12:47		256234	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/5/11 12:47		256234	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Methyl Acetate	10	U	10	0.23	1	NA	8/5/11 12:47		256234	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110801
Lab Code: R1104260-003

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Methylcyclohexane	10	U	10	0.25	1	NA	8/5/11 12:47		256234	
Styrene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Toluene	0.21	J	5.0	0.20	1	NA	8/5/11 12:47		256234	
Trichloroethene (TCE)	3.5	J	5.0	0.23	1	NA	8/5/11 12:47		256234	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
Vinyl Chloride	2600	D	100	4.7	20	NA	8/5/11 14:01		256234	
cis-1,2-Dichloroethene	55		5.0	0.20	1	NA	8/5/11 12:47		256234	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
n-Butyl Acetate	4.0	J	5.0	0.21	1	NA	8/5/11 12:47		256234	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	
trans-1,2-Dichloroethene	19		5.0	0.20	1	NA	8/5/11 12:47		256234	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 12:47		256234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	8/5/11 12:47	
Dibromofluoromethane	102	89-119	8/5/11 12:47	
Toluene-d8	110	87-121	8/5/11 12:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110801
Lab Code: R1104260-003

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	16		1.0	1	NA	8/9/11 13:47		257087	
Ethene	310	D	5.0	5	NA	8/9/11 13:58		257087	
Methane	30		2.0	1	NA	8/9/11 13:47		257087	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11
Date Analyzed: 8/12/11 21:38

Sample Name: LC34-RW0008-052.0-20110801
Lab Code: R1104260-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\081211\X0006044.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	130	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	28	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.1	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110801
Lab Code: R1104260-005

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	632	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	34.8	mg/L	3.0	30	NA	8/3/11 14:54	
Carbon, Total Organic (TOC), Average	9060A	487	mg/L	30	30	NA	8/11/11 19:10	
Chloride	300.0	138	mg/L	6.0	30	NA	8/3/11 14:54	
Iodide	300.0	44.5	mg/L	2.0	10	NA	8/16/11 11:45	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 15:36	
Nitrite as Nitrogen	300.0	3.0 U	mg/L	3.0	30	NA	8/3/11 14:54	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/2/11 15:36	
Sulfide, Total	SM 4500-S2- F	1.3	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20110801 Dissolved
Lab Code: R1104260-006

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:29	
Iron, Dissolved	6010C	3500	µg/L	100	1	8/ 7/11	8/13/11 02:29	
Manganese, Dissolved	6010C	126	µg/L	10	1	8/ 7/11	8/13/11 02:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1408
 Date Received: 8/ 2/11
 Date Analyzed: 8/8/11 20:52

Sample Name: LC34-IW0002I-027.5-20110801
 Lab Code: R1104260-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080811\J2655.D\

Analysis Lot: 256488
 Instrument Name: R-MS-07
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	9400	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	630000	25000	1100	
78-93-3	2-Butanone (MEK)	1400	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	440 J	2000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	26 J	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	130 J	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	
98-82-8	Isopropylbenzene (Cumene)	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11
Date Analyzed: 8/8/11 20:52

Sample Name: LC34-IW0002I-027.5-20110801
Lab Code: R1104260-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2655.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	1000	U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	280	J	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	270	J	500	23	
156-59-2	cis-1,2-Dichloroethene	13000		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	11000		500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	220	J	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/8/11 20:52	
Dibromofluoromethane	105	89-119	8/8/11 20:52	
Toluene-d8	106	87-121	8/8/11 20:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 14:11

Sample Name: LC34-IW0002I-027.5-20110801
Lab Code: R1104260-005

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star798.run

Analysis Lot: 257087
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	23		1.0	
74-85-1	Ethene	7.1		1.0	
74-82-8	Methane	44		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11
Date Analyzed: 8/15/11 12:11

Sample Name: LC34-IW0002I-027.5-20110801
Lab Code: R1104260-005

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006076.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	610	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	210	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110801
Lab Code: R1104260-007

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	1150		mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	9.1		mg/L	3.0	30	NA	8/3/11 15:37	
Carbon, Total Organic (TOC), Average	9060A	1130		mg/L	80	80	NA	8/11/11 21:09	
Chloride	300.0	352		mg/L	20	100	NA	8/3/11 15:08	
Iodide	300.0	41.6		mg/L	2.0	10	NA	8/16/11 11:54	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/2/11 15:49	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	8/3/11 15:08	*
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	8/2/11 15:49	
Sulfide, Total	SM 4500-S2- F	3.4		mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20110801 Dissolved
Lab Code: R1104260-008

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:35	
Iron, Dissolved	6010C	1590	µg/L	100	1	8/ 7/11	8/13/11 02:35	
Manganese, Dissolved	6010C	198	µg/L	10	1	8/ 7/11	8/13/11 02:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1315
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 15:49

Sample Name: LC34-IW0002D-037.5-20110801
 Lab Code: R1104260-007

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2627.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1000	U	1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	200000		50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	4000	U	4000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	1000	U	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	2000	U	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	1000	U	1000	44	
74-87-3	Chloromethane	1000	U	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	
75-09-2	Dichloromethane	1000	U	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 15:49

Sample Name: LC34-IW0002D-037.5-20110801
Lab Code: R1104260-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2627.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	74	J	1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	2200		1000	46	
156-59-2	cis-1,2-Dichloroethene	22000		1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	110	J	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	170	J	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/5/11 15:49	
Dibromofluoromethane	106	89-119	8/5/11 15:49	
Toluene-d8	107	87-121	8/5/11 15:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 15:58

Sample Name: LC34-IW0002D-037.5-20110801
Lab Code: R1104260-007

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star804.run

Analysis Lot: 257088
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	48		1.0	
74-85-1	Ethene	28		1.0	
74-82-8	Methane	43		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11
Date Analyzed: 8/15/11 17:19

Sample Name: LC34-IW0002D-037.5-20110801
Lab Code: R1104260-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006081.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	5.0 U	5.0	
64-19-7	Acetic Acid	1100	10	
107-92-6	Butanoic Acid (Butyric Acid)	1200	20	
50-21-5	Lactic Acid	10 U	10	
79-09-4	Propionic Acid	11	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110801
Lab Code: R1104260-009

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	660		mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	9.0		mg/L	3.0	30	NA	8/3/11 17:17	
Carbon, Total Organic (TOC), Average	9060A	587		mg/L	40	40	NA	8/11/11 21:49	
Chloride	300.0	451		mg/L	40	200	NA	8/3/11 17:03	
Iodide	300.0	5.1		mg/L	2.0	10	NA	8/16/11 12:03	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/2/11 16:45	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	8/3/11 17:03	*
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	8/2/11 16:45	
Sulfide, Total	SM 4500-S2- F	6.2		mg/L	1.0	1	NA	8/5/11 11:00	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110801 Dissolved
Lab Code: R1104260-010

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:40	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/ 7/11	8/13/11 02:40	
Manganese, Dissolved	6010C	60	µg/L	10	1	8/ 7/11	8/13/11 02:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20110801
 Lab Code: R1104260-009

Service Request: R1104260
 Date Collected: 8/1/11 1142
 Date Received: 8/2/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/3/11 18:54		255971	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/3/11 18:54		255971	
1,1,2-Trichloro-1,2,2-trifluoroethane	520	D	250	16	50	NA	8/5/11 16:26		256234	
1,1-Dichloroethane (1,1-DCA)	1.4	J	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,1-Dichloroethene (1,1-DCE)	12		5.0	0.29	1	NA	8/3/11 18:54		255971	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/3/11 18:54		255971	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/3/11 18:54		255971	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/3/11 18:54		255971	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
n-Butanol	2600		250	11	1	NA	8/3/11 18:54		255971	
2-Butanone (MEK)	3.1	J	10	0.51	1	NA	8/3/11 18:54		255971	
2-Hexanone	10	U	10	0.35	1	NA	8/3/11 18:54		255971	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/3/11 18:54		255971	
Acetone	20	U	20	0.98	1	NA	8/3/11 18:54		255971	
Benzene	5.0	U	5.0	0.21	1	NA	8/3/11 18:54		255971	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Bromoform	5.0	U	5.0	0.27	1	NA	8/3/11 18:54		255971	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/3/11 18:54		255971	
Carbon Disulfide	0.47	J	10	0.20	1	NA	8/3/11 18:54		255971	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/3/11 18:54		255971	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/3/11 18:54		255971	
Chloroform	1.2	J	5.0	0.22	1	NA	8/3/11 18:54		255971	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/3/11 18:54		255971	
Cyclohexane	10	U	10	0.24	1	NA	8/3/11 18:54		255971	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/3/11 18:54		255971	
Dichloromethane	0.88	J	5.0	0.22	1	NA	8/3/11 18:54		255971	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Methyl Acetate	10	U	10	0.23	1	NA	8/3/11 18:54		255971	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110801
Lab Code: R1104260-009

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Methylcyclohexane	10	U	10	0.25	1	NA	8/3/11 18:54		255971	
Styrene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Toluene	0.26	J	5.0	0.20	1	NA	8/3/11 18:54		255971	
Trichloroethene (TCE)	1300	D	250	12	50	NA	8/5/11 16:26		256234	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
Vinyl Chloride	1900	D	250	12	50	NA	8/5/11 16:26		256234	
cis-1,2-Dichloroethene	7500	D	250	10	50	NA	8/5/11 16:26		256234	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
n-Butyl Acetate	31		5.0	0.21	1	NA	8/3/11 18:54		255971	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	
trans-1,2-Dichloroethene	81		5.0	0.20	1	NA	8/3/11 18:54		255971	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/3/11 18:54		255971	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	111	85-122	8/3/11 18:54	
Dibromofluoromethane	115	89-119	8/3/11 18:54	
Toluene-d8	114	87-121	8/3/11 18:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20110801
Lab Code: R1104260-009

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	20		1.0	1	NA	8/9/11 16:13		257088	
Ethene	29		1.0	1	NA	8/9/11 16:13		257088	
Methane	5600	D	200	100	NA	8/9/11 17:46		257088	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11
Date Analyzed: 8/15/11 19:22

Sample Name: LC34-IW0002D1-052.5-20110801
Lab Code: R1104260-009

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006083.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	450	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	10 U	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	21	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110801
Lab Code: R1104260-011

Service Request: R1104260
Date Collected: 8/ 1/11 1501
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.2	mg/L	1.0	10	NA	8/5/11 17:48	
Carbon, Total Organic (TOC), Average	9060A	3.7	mg/L	1.0	1	NA	8/9/11 21:20	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 17:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110801 Dissolved
Lab Code: R1104260-012

Service Request: R1104260
Date Collected: 8/ 1/11 1501
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:46	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/ 7/11	8/13/11 02:46	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	8/ 7/11	8/13/11 02:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water
 Sample Name: LC34-IW0076-075.0-20110801
 Lab Code: R1104260-011

Service Request: R1104260
 Date Collected: 8/ 1/11 1501
 Date Received: 8/ 2/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	10	U	10	0.46	2	NA	8/5/11 17:03		256234	
1,1,2,2-Tetrachloroethane	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,1,2-Trichloroethane	10	U	10	0.46	2	NA	8/5/11 17:03		256234	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.3	J	10	0.62	2	NA	8/5/11 17:03		256234	
1,1-Dichloroethane (1,1-DCA)	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,1-Dichloroethene (1,1-DCE)	10	U	10	0.58	2	NA	8/5/11 17:03		256234	
1,2,4-Trichlorobenzene	10	U	10	0.52	2	NA	8/5/11 17:03		256234	
1,2-Dibromo-3-chloropropane (DBCP)	10	U	10	0.76	2	NA	8/5/11 17:03		256234	
1,2-Dibromoethane	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,2-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,2-Dichloroethane	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,2-Dichloropropane	10	U	10	0.56	2	NA	8/5/11 17:03		256234	
1,3-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
1,4-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
n-Butanol	200	J	500	21	2	NA	8/5/11 17:03		256234	
2-Butanone (MEK)	20	U	20	1.1	2	NA	8/5/11 17:03		256234	
2-Hexanone	20	U	20	0.70	2	NA	8/5/11 17:03		256234	
4-Methyl-2-pentanone	20	U	20	0.54	2	NA	8/5/11 17:03		256234	
Acetone	3.0	J	40	2.0	2	NA	8/5/11 17:03		256234	
Benzene	10	U	10	0.42	2	NA	8/5/11 17:03		256234	
Bromodichloromethane	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Bromoform	10	U	10	0.54	2	NA	8/5/11 17:03		256234	
Bromomethane	10	U	10	0.62	2	NA	8/5/11 17:03		256234	
Carbon Disulfide	20	U	20	0.40	2	NA	8/5/11 17:03		256234	
Carbon Tetrachloride	10	U	10	0.54	2	NA	8/5/11 17:03		256234	
Chlorobenzene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Chloroethane	10	U	10	0.62	2	NA	8/5/11 17:03		256234	
Chloroform	0.50	J	10	0.44	2	NA	8/5/11 17:03		256234	
Chloromethane	10	U	10	0.48	2	NA	8/5/11 17:03		256234	
Cyclohexane	20	U	20	0.48	2	NA	8/5/11 17:03		256234	
Dibromochloromethane	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Dichlorodifluoromethane (CFC 12)	10	U	10	1.2	2	NA	8/5/11 17:03		256234	
Dichloromethane	10	U	10	0.44	2	NA	8/5/11 17:03		256234	
Ethylbenzene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Isopropylbenzene (Cumene)	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Methyl Acetate	20	U	20	0.46	2	NA	8/5/11 17:03		256234	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20110801
Lab Code: R1104260-011

Service Request: R1104260
Date Collected: 8/ 1/11 1501
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Methylcyclohexane	20	U	20	0.50	2	NA	8/5/11 17:03		256234	
Styrene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Tetrachloroethene (PCE)	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Toluene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Trichloroethene (TCE)	10	U	10	0.46	2	NA	8/5/11 17:03		256234	
Trichlorofluoromethane (CFC 11)	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
Vinyl Chloride	10	U	10	0.46	2	NA	8/5/11 17:03		256234	
cis-1,2-Dichloroethene	4.0	J	10	0.40	2	NA	8/5/11 17:03		256234	
cis-1,3-Dichloropropene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
m,p-Xylenes	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
n-Butyl Acetate	550	D	25	1.1	5	NA	8/8/11 15:19		256488	
o-Xylene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
trans-1,2-Dichloroethene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	
trans-1,3-Dichloropropene	10	U	10	0.40	2	NA	8/5/11 17:03		256234	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	8/5/11 17:03	
Dibromofluoromethane	104	89-119	8/5/11 17:03	
Toluene-d8	107	87-121	8/5/11 17:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1501
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 16:23

Sample Name: LC34-IW0076-075.0-20110801
Lab Code: R1104260-011

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star806.run

Analysis Lot: 257088
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	7.7		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1501
Date Received: 8/ 2/11
Date Analyzed: 8/13/11 06:53

Sample Name: LC34-IW0076-075.0-20110801
Lab Code: R1104260-011

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006053.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110801
Lab Code: R1104260-013

Service Request: R1104260
Date Collected: 8/ 1/11 1226
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	293	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 15:08	
Carbon, Total Organic (TOC), Average	9060A	4.2	mg/L	1.0	1	NA	8/9/11 21:59	
Chloride	300.0	137	mg/L	6.0	30	NA	8/3/11 14:26	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 12:11	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 15:08	
Nitrite as Nitrogen	300.0	3.0 U	mg/L	3.0	30	NA	8/3/11 14:26	*
Sulfate	300.0	53.6	mg/L	2.0	10	NA	8/2/11 15:08	
Sulfide, Total	SM 4500-S2- F	1.0 U	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20110801 Dissolved
Lab Code: R1104260-014

Service Request: R1104260
Date Collected: 8/ 1/11 1226
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 02:52	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/ 7/11	8/13/11 02:52	
Manganese, Dissolved	6010C	29		µg/L	10	1	8/ 7/11	8/13/11 02:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1226
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 17:40

Sample Name: LC34-BW0001A-024.5-20110801
 Lab Code: R1104260-013

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2630.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	120	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	100	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	120	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	87000		2500	160	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	130	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	
106-93-4	1,2-Dibromoethane	2500	U	2500	100	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	100	
107-06-2	1,2-Dichloroethane	2500	U	2500	100	
78-87-5	1,2-Dichloropropane	2500	U	2500	140	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	100	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	100	
71-36-3	n-Butanol	130000	U	130000	5300	
78-93-3	2-Butanone (MEK)	5000	U	5000	260	
591-78-6	2-Hexanone	5000	U	5000	180	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	140	
67-64-1	Acetone	2900	J	10000	490	
71-43-2	Benzene	2500	U	2500	110	
75-27-4	Bromodichloromethane	230	J	2500	100	
75-25-2	Bromoform	2500	U	2500	140	
74-83-9	Bromomethane	2500	U	2500	160	
75-15-0	Carbon Disulfide	5000	U	5000	100	
56-23-5	Carbon Tetrachloride	2500	U	2500	140	
108-90-7	Chlorobenzene	2500	U	2500	100	
75-00-3	Chloroethane	2500	U	2500	160	
67-66-3	Chloroform	1200	J	2500	110	
74-87-3	Chloromethane	2500	U	2500	120	
110-82-7	Cyclohexane	5000	U	5000	120	
124-48-1	Dibromochloromethane	2500	U	2500	100	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	
75-09-2	Dichloromethane	2500	U	2500	110	
100-41-4	Ethylbenzene	2500	U	2500	100	
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	100	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1226
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 17:40

Sample Name: LC34-BW0001A-024.5-20110801
Lab Code: R1104260-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2630.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	5000	U	5000	120	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	100	
108-87-2	Methylcyclohexane	5000	U	5000	130	
100-42-5	Styrene	2500	U	2500	100	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	100	
108-88-3	Toluene	2500	U	2500	100	
79-01-6	Trichloroethene (TCE)	300	J	2500	120	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	100	
75-01-4	Vinyl Chloride	4000		2500	120	
156-59-2	cis-1,2-Dichloroethene	36000		2500	100	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	100	
179601-23-1	m,p-Xylenes	2500	U	2500	100	
123-86-4	n-Butyl Acetate	340	J	2500	110	
95-47-6	o-Xylene	2500	U	2500	100	
156-60-5	trans-1,2-Dichloroethene	690	J	2500	100	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	100	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 17:40	
Dibromofluoromethane	104	89-119	8/5/11 17:40	
Toluene-d8	106	87-121	8/5/11 17:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1226
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 16:40

Sample Name: LC34-BW0001A-024.5-20110801
Lab Code: R1104260-013

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star807.run

Analysis Lot: 257088
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	15	1.0	
74-85-1	Ethene	27	1.0	
74-82-8	Methane	92	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1226
Date Received: 8/ 2/11
Date Analyzed: 8/13/11 08:56

Sample Name: LC34-BW0001A-024.5-20110801
Lab Code: R1104260-013

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006055.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110801
Lab Code: R1104260-015

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	350		mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	8/2/11 13:59	
Carbon, Total Organic (TOC), Average	9060A	8.0		mg/L	1.0	1	NA	8/9/11 22:39	
Chloride	300.0	322		mg/L	20	100	NA	8/3/11 13:57	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 12:20	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/2/11 13:59	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	8/3/11 13:57	*
Sulfate	300.0	38.1		mg/L	2.0	10	NA	8/2/11 13:59	
Sulfide, Total	SM 4500-S2- F	4.5		mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110801 Dissolved
Lab Code: R1104260-016

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/10/11	8/12/11 20:21	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/10/11	8/12/11 20:21	
Manganese, Dissolved	6010C	28		µg/L	10	1	8/10/11	8/12/11 20:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1137
 Date Received: 8/ 2/11
 Date Analyzed: 8/4/11 13:39

Sample Name: LC34-BW0001B-031.5-20110801
 Lab Code: R1104260-015

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3830.D\

Analysis Lot: 256370
 Instrument Name: R-MS-10
 Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	140000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	250000	U	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	20000	U	20000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11
Date Analyzed: 8/4/11 13:39

Sample Name: LC34-BW0001B-031.5-20110801
Lab Code: R1104260-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3830.D\

Analysis Lot: 256370
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	19000		5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	600	J	5000	230	
156-59-2	cis-1,2-Dichloroethene	14000		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	1000	J	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	270	J	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	8/4/11 13:39	
Dibromofluoromethane	112	89-119	8/4/11 13:39	
Toluene-d8	113	87-121	8/4/11 13:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11
Date Analyzed: 8/9/11 16:51

Sample Name: LC34-BW0001B-031.5-20110801
Lab Code: R1104260-015

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star808.run

Analysis Lot: 257088
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	51		1.0	
74-85-1	Ethene	30		1.0	
74-82-8	Methane	100		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11
Date Analyzed: 8/13/11 10:59

Sample Name: LC34-BW0001B-031.5-20110801
Lab Code: R1104260-015

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006057.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.7	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110801
Lab Code: R1104260-017

Service Request: R1104260
Date Collected: 8/ 1/11 1054
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	408	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	23.2	mg/L	1.0	10	NA	8/2/11 16:03	
Carbon, Total Organic (TOC), Average	9060A	301	mg/L	20	20	NA	8/11/11 22:29	
Chloride	300.0	500	mg/L	40	200	NA	8/3/11 16:34	
Iodide	300.0	17.9	mg/L	2.0	10	NA	8/16/11 12:28	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 16:03	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	8/3/11 16:34	*
Sulfate	300.0	2.3	mg/L	2.0	10	NA	8/2/11 16:03	
Sulfide, Total	SM 4500-S2- F	6.2	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110801 Dissolved
Lab Code: R1104260-018

Service Request: R1104260
Date Collected: 8/ 1/11 1054
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/10/11	8/12/11 20:50	
Iron, Dissolved	6010C	120		µg/L	100	1	8/10/11	8/12/11 20:50	
Manganese, Dissolved	6010C	30		µg/L	10	1	8/10/11	8/12/11 20:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1054
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 18:16

Sample Name: LC34-BW0001C-038.5-20110801
 Lab Code: R1104260-017

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2631.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500 U	2500	120	
79-34-5	1,1,2,2-Tetrachloroethane	2500 U	2500	100	
79-00-5	1,1,2-Trichloroethane	2500 U	2500	120	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	14000	2500	160	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500 U	2500	100	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500 U	2500	150	
120-82-1	1,2,4-Trichlorobenzene	2500 U	2500	130	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500 U	2500	190	
106-93-4	1,2-Dibromoethane	2500 U	2500	100	
95-50-1	1,2-Dichlorobenzene	2500 U	2500	100	
107-06-2	1,2-Dichloroethane	2500 U	2500	100	
78-87-5	1,2-Dichloropropane	2500 U	2500	140	
541-73-1	1,3-Dichlorobenzene	2500 U	2500	100	
106-46-7	1,4-Dichlorobenzene	2500 U	2500	100	
71-36-3	n-Butanol	280000	130000	5300	
78-93-3	2-Butanone (MEK)	5000 U	5000	260	
591-78-6	2-Hexanone	5000 U	5000	180	
108-10-1	4-Methyl-2-pentanone	5000 U	5000	140	
67-64-1	Acetone	960 J	10000	490	
71-43-2	Benzene	2500 U	2500	110	
75-27-4	Bromodichloromethane	150 J	2500	100	
75-25-2	Bromoform	2500 U	2500	140	
74-83-9	Bromomethane	2500 U	2500	160	
75-15-0	Carbon Disulfide	5000 U	5000	100	
56-23-5	Carbon Tetrachloride	2500 U	2500	140	
108-90-7	Chlorobenzene	2500 U	2500	100	
75-00-3	Chloroethane	2500 U	2500	160	
67-66-3	Chloroform	840 J	2500	110	
74-87-3	Chloromethane	2500 U	2500	120	
110-82-7	Cyclohexane	5000 U	5000	120	
124-48-1	Dibromochloromethane	2500 U	2500	100	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500 U	2500	280	
75-09-2	Dichloromethane	2500 U	2500	110	
100-41-4	Ethylbenzene	2500 U	2500	100	
98-82-8	Isopropylbenzene (Cumene)	2500 U	2500	100	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1054
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 18:16

Sample Name: LC34-BW0001C-038.5-20110801
Lab Code: R1104260-017

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2631.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	5000	U	5000	120	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	100	
108-87-2	Methylcyclohexane	5000	U	5000	130	
100-42-5	Styrene	2500	U	2500	100	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	100	
108-88-3	Toluene	2500	U	2500	100	
79-01-6	Trichloroethene (TCE)	27000		2500	120	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	100	
75-01-4	Vinyl Chloride	480	J	2500	120	
156-59-2	cis-1,2-Dichloroethene	31000		2500	100	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	100	
179601-23-1	m,p-Xylenes	2500	U	2500	100	
123-86-4	n-Butyl Acetate	95000		2500	110	
95-47-6	o-Xylene	2500	U	2500	100	
156-60-5	trans-1,2-Dichloroethene	210	J	2500	100	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	100	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 18:16	
Dibromofluoromethane	106	89-119	8/5/11 18:16	
Toluene-d8	108	87-121	8/5/11 18:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20110801
Lab Code: R1104260-017

Service Request: R1104260
Date Collected: 8/ 1/11 1054
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	130	D	2.0	2	NA	8/10/11 11:21		257189	
Ethene	16		1.0	1	NA	8/10/11 11:09		257189	
Methane	47		2.0	1	NA	8/10/11 11:09		257189	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1054
Date Received: 8/ 2/11
Date Analyzed: 8/16/11 04:37

Sample Name: LC34-BW0001C-038.5-20110801
Lab Code: R1104260-017

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006092.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	370	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	120	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110801
Lab Code: R1104260-019

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	250		mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	2.9		mg/L	1.0	10	NA	8/2/11 15:22	
Carbon, Total Organic (TOC), Average	9060A	37.2		mg/L	2.0	2	NA	8/9/11 23:19	
Chloride	300.0	670		mg/L	40	200	NA	8/3/11 14:40	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 12:37	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/2/11 15:22	
Nitrite as Nitrogen	300.0	20	U	mg/L	20	200	NA	8/3/11 14:40	*
Sulfate	300.0	79.2		mg/L	2.0	10	NA	8/2/11 15:22	
Sulfide, Total	SM 4500-S2- F	1.2		mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110801 Dissolved
Lab Code: R1104260-020

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/10/11	8/12/11 20:56	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/10/11	8/12/11 20:56	
Manganese, Dissolved	6010C	29		µg/L	10	1	8/10/11	8/12/11 20:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1324
 Date Received: 8/ 2/11
 Date Analyzed: 8/4/11 14:39

Sample Name: LC34-BW0001D-045.5-20110801
 Lab Code: R1104260-019

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3832.D\

Analysis Lot: 256370
 Instrument Name: R-MS-10
 Dilution Factor: 1000

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000 U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000 U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000 U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	32000	5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000 U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000 U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000 U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000 U	5000	380	
106-93-4	1,2-Dibromoethane	5000 U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000 U	5000	200	
107-06-2	1,2-Dichloroethane	5000 U	5000	200	
78-87-5	1,2-Dichloropropane	5000 U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000 U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000 U	5000	200	
71-36-3	n-Butanol	15000 J	250000	11000	
78-93-3	2-Butanone (MEK)	10000 U	10000	510	
591-78-6	2-Hexanone	10000 U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000 U	10000	270	
67-64-1	Acetone	1200 J	20000	980	
71-43-2	Benzene	5000 U	5000	210	
75-27-4	Bromodichloromethane	5000 U	5000	200	
75-25-2	Bromoform	5000 U	5000	270	
74-83-9	Bromomethane	5000 U	5000	310	
75-15-0	Carbon Disulfide	10000 U	10000	200	
56-23-5	Carbon Tetrachloride	5000 U	5000	270	
108-90-7	Chlorobenzene	5000 U	5000	200	
75-00-3	Chloroethane	5000 U	5000	310	
67-66-3	Chloroform	290 J	5000	220	
74-87-3	Chloromethane	5000 U	5000	240	
110-82-7	Cyclohexane	10000 U	10000	240	
124-48-1	Dibromochloromethane	5000 U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000 U	5000	560	
75-09-2	Dichloromethane	5000 U	5000	220	
100-41-4	Ethylbenzene	5000 U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000 U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11
Date Analyzed: 8/4/11 14:39

Sample Name: LC34-BW0001D-045.5-20110801
Lab Code: R1104260-019

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3832.D\

Analysis Lot: 256370
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	120000		5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	5000	U	5000	230	
156-59-2	cis-1,2-Dichloroethene	4300	J	5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	71000		5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	8/4/11 14:39	
Dibromofluoromethane	110	89-119	8/4/11 14:39	
Toluene-d8	114	87-121	8/4/11 14:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110801
Lab Code: R1104260-019

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	140	D	2.5	2.5	NA	8/9/11 17:19		257088	
Ethene	5.4		1.0	1	NA	8/9/11 17:07		257088	
Methane	19		2.0	1	NA	8/9/11 17:07		257088	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11
Date Analyzed: 8/13/11 16:07

Sample Name: LC34-BW0001D-045.5-20110801
Lab Code: R1104260-019

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006062.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	21	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	4.0	2.0	
50-21-5	Lactic Acid	1.2	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Service Request: R1104260
Date Collected: 8/ 1/11 1421
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	183	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	1.4	mg/L	1.0	10	NA	8/2/11 14:54	
Carbon, Total Organic (TOC), Average	9060A	8.3	mg/L	1.0	1	NA	8/9/11 23:59	
Chloride	300.0	595	mg/L	40	200	NA	8/3/11 14:11	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 13:02	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 14:54	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	8/3/11 14:11	
Sulfate	300.0	77.3	mg/L	2.0	10	NA	8/2/11 14:54	
Sulfide, Total	SM 4500-S2- F	1.5	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20110801 Dissolved
Lab Code: R1104260-022

Service Request: R1104260
Date Collected: 8/ 1/11 1421
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/10/11	8/12/11 21:14	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/10/11	8/12/11 21:14	
Manganese, Dissolved	6010C	17		µg/L	10	1	8/10/11	8/12/11 21:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1421
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 18:53

Sample Name: LC34-BW0001E-052.5-20110801
 Lab Code: R1104260-021

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2632.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.5	J	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	3.1	J	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	
106-93-4	1,2-Dibromoethane	50	U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.0	
107-06-2	1,2-Dichloroethane	50	U	50	2.0	
78-87-5	1,2-Dichloropropane	50	U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	730	J	2500	110	
78-93-3	2-Butanone (MEK)	100	U	100	5.1	
591-78-6	2-Hexanone	100	U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100	U	100	2.7	
67-64-1	Acetone	200	U	200	9.8	
71-43-2	Benzene	50	U	50	2.1	
75-27-4	Bromodichloromethane	50	U	50	2.0	
75-25-2	Bromoform	50	U	50	2.7	
74-83-9	Bromomethane	50	U	50	3.1	
75-15-0	Carbon Disulfide	100	U	100	2.0	
56-23-5	Carbon Tetrachloride	50	U	50	2.7	
108-90-7	Chlorobenzene	50	U	50	2.0	
75-00-3	Chloroethane	50	U	50	3.1	
67-66-3	Chloroform	4.4	J	50	2.2	
74-87-3	Chloromethane	50	U	50	2.4	
110-82-7	Cyclohexane	100	U	100	2.4	
124-48-1	Dibromochloromethane	50	U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	
75-09-2	Dichloromethane	50	U	50	2.2	
100-41-4	Ethylbenzene	50	U	50	2.0	
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1421
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 18:53

Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2632.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	32	J	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	23	J	50	2.4	
156-59-2	cis-1,2-Dichloroethene	1400		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	4.6	J	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	8.9	J	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/5/11 18:53	
Dibromofluoromethane	106	89-119	8/5/11 18:53	
Toluene-d8	108	87-121	8/5/11 18:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1421
Date Received: 8/ 2/11
Date Analyzed: 8/10/11 11:31

Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star819.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	10		1.0	
74-85-1	Ethene	2.1		1.0	
74-82-8	Methane	9.9		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1421
Date Received: 8/ 2/11
Date Analyzed: 8/13/11 18:10

Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006064.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	10	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110801
Lab Code: R1104260-023

Service Request: R1104260
Date Collected: 8/ 1/11 1509
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	504	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	26.9	mg/L	1.0	10	NA	8/2/11 17:26	
Carbon, Total Organic (TOC), Average	9060A	606	mg/L	50	50	NA	8/11/11 23:09	
Chloride	300.0	409	mg/L	40	200	NA	8/3/11 18:00	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 13:28	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 17:26	
Nitrite as Nitrogen	300.0	20 U	mg/L	20	200	NA	8/3/11 18:00	*
Sulfate	300.0	45.7	mg/L	2.0	10	NA	8/2/11 17:26	
Sulfide, Total	SM 4500-S2- F	5.8	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20110801 Dissolved
Lab Code: R1104260-024

Service Request: R1104260
Date Collected: 8/ 1/11 1509
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/10/11	8/12/11 21:20	
Iron, Dissolved	6010C	350		µg/L	100	1	8/10/11	8/12/11 21:20	
Manganese, Dissolved	6010C	36		µg/L	10	1	8/10/11	8/12/11 21:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1509
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 19:30

Sample Name: LC34-BW0001F-059.5-20110801
 Lab Code: R1104260-023

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2633.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 5000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	25000	U	25000	1200	
79-34-5	1,1,2,2-Tetrachloroethane	25000	U	25000	1000	
79-00-5	1,1,2-Trichloroethane	25000	U	25000	1200	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	25000	U	25000	1600	
75-34-3	1,1-Dichloroethane (1,1-DCA)	25000	U	25000	1000	
75-35-4	1,1-Dichloroethene (1,1-DCE)	25000	U	25000	1500	
120-82-1	1,2,4-Trichlorobenzene	25000	U	25000	1300	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	25000	U	25000	1900	
106-93-4	1,2-Dibromoethane	25000	U	25000	1000	
95-50-1	1,2-Dichlorobenzene	25000	U	25000	1000	
107-06-2	1,2-Dichloroethane	25000	U	25000	1000	
78-87-5	1,2-Dichloropropane	25000	U	25000	1500	
541-73-1	1,3-Dichlorobenzene	25000	U	25000	1000	
106-46-7	1,4-Dichlorobenzene	25000	U	25000	1000	
71-36-3	n-Butanol	620000	J	1300000	53000	
78-93-3	2-Butanone (MEK)	50000	U	50000	2600	
591-78-6	2-Hexanone	50000	U	50000	1800	
108-10-1	4-Methyl-2-pentanone	50000	U	50000	1400	
67-64-1	Acetone	100000	U	100000	4900	
71-43-2	Benzene	25000	U	25000	1100	
75-27-4	Bromodichloromethane	25000	U	25000	1000	
75-25-2	Bromoform	25000	U	25000	1400	
74-83-9	Bromomethane	25000	U	25000	1600	
75-15-0	Carbon Disulfide	50000	U	50000	1000	
56-23-5	Carbon Tetrachloride	25000	U	25000	1400	
108-90-7	Chlorobenzene	25000	U	25000	1000	
75-00-3	Chloroethane	25000	U	25000	1600	
67-66-3	Chloroform	1900	J	25000	1100	
74-87-3	Chloromethane	25000	U	25000	1200	
110-82-7	Cyclohexane	50000	U	50000	1200	
124-48-1	Dibromochloromethane	25000	U	25000	1000	
75-71-8	Dichlorodifluoromethane (CFC 12)	25000	U	25000	2900	
75-09-2	Dichloromethane	25000	U	25000	1100	
100-41-4	Ethylbenzene	25000	U	25000	1000	
98-82-8	Isopropylbenzene (Cumene)	25000	U	25000	1000	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1509
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 19:30

Sample Name: LC34-BW0001F-059.5-20110801
Lab Code: R1104260-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2633.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 5000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	3100	J	50000	1200	
1634-04-4	Methyl tert-Butyl Ether	25000	U	25000	1000	
108-87-2	Methylcyclohexane	50000	U	50000	1300	
100-42-5	Styrene	25000	U	25000	1000	
127-18-4	Tetrachloroethene (PCE)	25000	U	25000	1000	
108-88-3	Toluene	25000	U	25000	1000	
79-01-6	Trichloroethene (TCE)	25000	U	25000	1200	
75-69-4	Trichlorofluoromethane (CFC 11)	25000	U	25000	1000	
75-01-4	Vinyl Chloride	25000	U	25000	1200	
156-59-2	cis-1,2-Dichloroethene	25000	U	25000	1000	
10061-01-5	cis-1,3-Dichloropropene	25000	U	25000	1000	
179601-23-1	m,p-Xylenes	25000	U	25000	1000	
123-86-4	n-Butyl Acetate	900000		25000	1100	
95-47-6	o-Xylene	25000	U	25000	1000	
156-60-5	trans-1,2-Dichloroethene	25000	U	25000	1000	
10061-02-6	trans-1,3-Dichloropropene	25000	U	25000	1000	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/5/11 19:30	
Dibromofluoromethane	106	89-119	8/5/11 19:30	
Toluene-d8	108	87-121	8/5/11 19:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1509
Date Received: 8/ 2/11
Date Analyzed: 8/10/11 11:41

Sample Name: LC34-BW0001F-059.5-20110801
Lab Code: R1104260-023

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star820.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	4.3	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1509
Date Received: 8/ 2/11
Date Analyzed: 8/16/11 07:41

Sample Name: LC34-BW0001F-059.5-20110801
Lab Code: R1104260-023

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006095.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	590	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	30	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1052
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 16:38

Sample Name: LC34-RW0007-038.5-20110801-D
 Lab Code: R1104260-025

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\8432.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3500		1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	66	J	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	240000		50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	620	BJ	4000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	46	J	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	2000	U	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	230	J	1000	44	
74-87-3	Chloromethane	62	J	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	
75-09-2	Dichloromethane	46	J	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1052
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 16:38

Sample Name: LC34-RW0007-038.5-20110801-D
Lab Code: R1104260-025

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\080511\VL8432.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	2800		1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	810	J	1000	46	
156-59-2	cis-1,2-Dichloroethene	36000		1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	170	J	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	130	J	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	8/5/11 16:38	
Dibromofluoromethane	100	89-119	8/5/11 16:38	
Toluene-d8	99	87-121	8/5/11 16:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11 1408
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 14:02

Sample Name: LC34-IW0002I-027.5-20110801-D
 Lab Code: R1104260-026

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\1\8426.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	16000		1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	
106-93-4	1,2-Dibromoethane	1300	U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	50	
107-06-2	1,2-Dichloroethane	1300	U	1300	50	
78-87-5	1,2-Dichloropropane	1300	U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	50	
71-36-3	n-Butanol	590000		63000	2700	
78-93-3	2-Butanone (MEK)	2500	U	2500	130	
591-78-6	2-Hexanone	2500	U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	68	
67-64-1	Acetone	460	BJ	5000	250	
71-43-2	Benzene	1300	U	1300	53	
75-27-4	Bromodichloromethane	1300	U	1300	50	
75-25-2	Bromoform	1300	U	1300	68	
74-83-9	Bromomethane	1300	U	1300	78	
75-15-0	Carbon Disulfide	2500	U	2500	50	
56-23-5	Carbon Tetrachloride	1300	U	1300	68	
108-90-7	Chlorobenzene	1300	U	1300	50	
75-00-3	Chloroethane	1300	U	1300	78	
67-66-3	Chloroform	120	J	1300	55	
74-87-3	Chloromethane	60	J	1300	60	
110-82-7	Cyclohexane	2500	U	2500	60	
124-48-1	Dibromochloromethane	1300	U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	
75-09-2	Dichloromethane	1300	U	1300	55	
100-41-4	Ethylbenzene	1300	U	1300	50	
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1408
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 14:02

Sample Name: LC34-IW0002I-027.5-20110801-D
Lab Code: R1104260-026

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8426.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2500	U	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	50	
108-87-2	Methylcyclohexane	2500	U	2500	63	
100-42-5	Styrene	1300	U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	50	
108-88-3	Toluene	1300	U	1300	50	
79-01-6	Trichloroethene (TCE)	310	J	1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	50	
75-01-4	Vinyl Chloride	370	J	1300	58	
156-59-2	cis-1,2-Dichloroethene	14000		1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	50	
179601-23-1	m,p-Xylenes	1300	U	1300	50	
123-86-4	n-Butyl Acetate	33000		1300	53	
95-47-6	o-Xylene	1300	U	1300	50	
156-60-5	trans-1,2-Dichloroethene	260	J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	8/5/11 14:02	
Dibromofluoromethane	98	89-119	8/5/11 14:02	
Toluene-d8	99	87-121	8/5/11 14:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1315
Date Received: 8/ 2/11
Date Analyzed: 8/16/11 09:45

Sample Name: LC34-IW0002D-037.5-20110801-D
Lab Code: R1104260-027

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006097.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	5.0 U	5.0	
64-19-7	Acetic Acid	1100	10	
107-92-6	Butanoic Acid (Butyric Acid)	1200	20	
50-21-5	Lactic Acid	10 U	10	
79-09-4	Propionic Acid	10 U	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20110801-D
Lab Code: R1104260-028

Service Request: R1104260
Date Collected: 8/ 1/11 1137
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	8/5/11 18:01	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 17:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20110801-D
Lab Code: R1104260-029

Service Request: R1104260
Date Collected: 8/ 1/11 1324
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	245	mg/L	2.0	1	NA	8/9/11 09:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110801-D
Lab Code: R1104260-030

Service Request: R1104260
Date Collected: 8/ 1/11 0954
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	629	mg/L	20	100	NA	8/3/11 19:25	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/2/11 16:31	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	8/3/11 19:25	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/2/11 16:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11

Sample Name: LC34-IW0002D1-052.5-20110801-D Dissolved
Lab Code: R1104260-032

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 21:25	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/10/11	8/12/11 21:25	
Manganese, Dissolved	6010C	59	µg/L	10	1	8/10/11	8/12/11 21:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11 1142
Date Received: 8/ 2/11

Sample Name: LC34-IW0002D1-052.5-20110801-D
Lab Code: R1104260-031

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	22		1.0	1	NA	8/10/11 11:50		257189	
Ethene	31		1.0	1	NA	8/10/11 11:50		257189	
Methane	5800	D	200	100	NA	8/10/11 13:31		257189	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water
 Sample Name: LC34-FD-20110801-01
 Lab Code: R1104260-033

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	10	U	10	0.46	2	NA	8/5/11 14:31		256275	
1,1,2,2-Tetrachloroethane	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
1,1,2-Trichloroethane	10	U	10	0.46	2	NA	8/5/11 14:31		256275	
1,1,2-Trichloro-1,2,2-trifluoroethane	2.2	J	10	0.62	2	NA	8/5/11 14:31		256275	
1,1-Dichloroethane (1,1-DCA)	0.92	J	10	0.40	2	NA	8/5/11 14:31		256275	
1,1-Dichloroethene (1,1-DCE)	10	U	10	0.58	2	NA	8/5/11 14:31		256275	
1,2,4-Trichlorobenzene	10	U	10	0.52	2	NA	8/5/11 14:31		256275	
1,2-Dibromo-3-chloropropane (DBCP)	10	U	10	0.76	2	NA	8/5/11 14:31		256275	
1,2-Dibromoethane	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
1,2-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
1,2-Dichloroethane	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
1,2-Dichloropropane	10	U	10	0.56	2	NA	8/5/11 14:31		256275	
1,3-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
1,4-Dichlorobenzene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
n-Butanol	220	J	500	21	2	NA	8/5/11 14:31		256275	
2-Butanone (MEK)	3.6	J	20	1.1	2	NA	8/5/11 14:31		256275	
2-Hexanone	20	U	20	0.70	2	NA	8/5/11 14:31		256275	
4-Methyl-2-pentanone	20	U	20	0.54	2	NA	8/5/11 14:31		256275	
Acetone	7.5	BJ	40	2.0	2	NA	8/5/11 14:31		256275	
Benzene	10	U	10	0.42	2	NA	8/5/11 14:31		256275	
Bromodichloromethane	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Bromoform	10	U	10	0.54	2	NA	8/5/11 14:31		256275	
Bromomethane	10	U	10	0.62	2	NA	8/5/11 14:31		256275	
Carbon Disulfide	4.2	J	20	0.40	2	NA	8/5/11 14:31		256275	
Carbon Tetrachloride	10	U	10	0.54	2	NA	8/5/11 14:31		256275	
Chlorobenzene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Chloroethane	10	U	10	0.62	2	NA	8/5/11 14:31		256275	
Chloroform	10	U	10	0.44	2	NA	8/5/11 14:31		256275	
Chloromethane	1.4	J	10	0.48	2	NA	8/5/11 14:31		256275	
Cyclohexane	20	U	20	0.48	2	NA	8/5/11 14:31		256275	
Dibromochloromethane	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Dichlorodifluoromethane (CFC 12)	10	U	10	1.2	2	NA	8/5/11 14:31		256275	
Dichloromethane	10	U	10	0.44	2	NA	8/5/11 14:31		256275	
Ethylbenzene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Isopropylbenzene (Cumene)	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Methyl Acetate	20	U	20	0.46	2	NA	8/5/11 14:31		256275	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110801-01
Lab Code: R1104260-033

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Methylcyclohexane	20	U	20	0.50	2	NA	8/5/11 14:31		256275	
Styrene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Tetrachloroethene (PCE)	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Toluene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Trichloroethene (TCE)	3.2	J	10	0.46	2	NA	8/5/11 14:31		256275	
Trichlorofluoromethane (CFC 11)	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
Vinyl Chloride	2900	D	100	4.7	20	NA	8/8/11 14:42		256488	
cis-1,2-Dichloroethene	47		10	0.40	2	NA	8/5/11 14:31		256275	
cis-1,3-Dichloropropene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
m,p-Xylenes	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
n-Butyl Acetate	4.3	J	10	0.42	2	NA	8/5/11 14:31		256275	
o-Xylene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	
trans-1,2-Dichloroethene	17		10	0.40	2	NA	8/5/11 14:31		256275	
trans-1,3-Dichloropropene	10	U	10	0.40	2	NA	8/5/11 14:31		256275	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	8/5/11 14:31	
Dibromofluoromethane	100	89-119	8/5/11 14:31	
Toluene-d8	99	87-121	8/5/11 14:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 15:12

Sample Name: LC34-FD-20110801-03
 Lab Code: R1104260-034

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\1L8429.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	4100		1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	94	J	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	230000		50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	550	BJ	4000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	60	J	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	2000	U	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	260	J	1000	44	
74-87-3	Chloromethane	96	J	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	
75-09-2	Dichloromethane	1000	U	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 15:12

Sample Name: LC34-FD-20110801-03
Lab Code: R1104260-034

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\080511\VL8429.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	3300		1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	850	J	1000	46	
156-59-2	cis-1,2-Dichloroethene	36000		1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	130	J	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	130	J	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	8/5/11 15:12	
Dibromofluoromethane	99	89-119	8/5/11 15:12	
Toluene-d8	99	87-121	8/5/11 15:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 15:41

Sample Name: LC34-FD-20110801-04
 Lab Code: R1104260-035

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8430.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	120000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	49000	J	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	3000	BJ	20000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 15:41

Sample Name: LC34-FD-20110801-04
Lab Code: R1104260-035

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8430.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	470	J	5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	5200		5000	230	
156-59-2	cis-1,2-Dichloroethene	39000		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	670	J	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	680	J	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/5/11 15:41	
Dibromofluoromethane	101	89-119	8/5/11 15:41	
Toluene-d8	102	87-121	8/5/11 15:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11
 Date Received: 8/ 2/11
 Date Analyzed: 8/5/11 16:09

Sample Name: LC34-FD-20110801-05
 Lab Code: R1104260-036

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8431.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	39000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	22000	J	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	3400	BJ	20000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	270	J	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11
Date Analyzed: 8/5/11 16:09

Sample Name: LC34-FD-20110801-05
Lab Code: R1104260-036

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\080511\L8431.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 1000

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000 U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000 U	5000	200	
108-87-2	Methylcyclohexane	10000 U	10000	250	
100-42-5	Styrene	5000 U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000 U	5000	200	
108-88-3	Toluene	5000 U	5000	200	
79-01-6	Trichloroethene (TCE)	170000	5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000 U	5000	200	
75-01-4	Vinyl Chloride	5000 U	5000	230	
156-59-2	cis-1,2-Dichloroethene	5900	5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000 U	5000	200	
179601-23-1	m,p-Xylenes	5000 U	5000	200	
123-86-4	n-Butyl Acetate	84000	5000	210	
95-47-6	o-Xylene	5000 U	5000	200	
156-60-5	trans-1,2-Dichloroethene	5000 U	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000 U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	8/5/11 16:09	
Dibromofluoromethane	103	89-119	8/5/11 16:09	
Toluene-d8	102	87-121	8/5/11 16:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11
Date Analyzed: 8/16/11 11:48

Sample Name: LC34-FD-20110801-06
Lab Code: R1104260-037

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006099.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	620	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	200	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110801-09
Lab Code: R1104260-038

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	20.5	mg/L	1.0	10	NA	8/5/11 18:15	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 17:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110801-02
Lab Code: R1104260-039

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	304		mg/L	20	20	NA	8/11/11 23:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110801-07
Lab Code: R1104260-040

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfide, Total	SM 4500-S2- F	1.5	mg/L	1.1	1	NA	8/5/11 11:00	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: LC34-FD-20110801-08 Dissolved
Lab Code: R1104260-041

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 21:31	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/10/11	8/12/11 21:31	
Manganese, Dissolved	6010C	10	µg/L	10	1	8/10/11	8/12/11 21:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/ 1/11
 Date Received: 8/ 2/11
 Date Analyzed: 8/4/11 13:09

Sample Name: LC34-TB-20110801
 Lab Code: R1104260-042

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3829.D\

Analysis Lot: 256370
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/ 1/11
Date Received: 8/ 2/11
Date Analyzed: 8/4/11 13:09

Sample Name: LC34-TB-20110801
Lab Code: R1104260-042

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3829.D\

Analysis Lot: 256370
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/4/11 13:09	
Dibromofluoromethane	111	89-119	8/4/11 13:09	
Toluene-d8	113	87-121	8/4/11 13:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB1

Service Request: R1104260
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/2/11 08:02	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/9/11 17:20	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/3/11 13:14	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 11:01	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/2/11 08:02	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/3/11 13:14	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/2/11 08:02	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB2

Service Request: R1104260
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/9/11 09:15	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/2/11 14:27	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/11/11 17:10	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/3/11 18:57	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 14:37	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/2/11 14:27	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/3/11 18:57	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/2/11 14:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB3

Service Request: R1104260
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U mg/L	0.10	1	NA	8/3/11 13:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB4

Service Request: R1104260
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	8/5/11 13:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB1

Service Request: R1104260
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 20:04	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/10/11	8/12/11 20:04	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 20:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB2

Service Request: R1104260
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 20:16	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/10/11	8/12/11 20:16	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	8/10/11	8/12/11 20:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB3

Service Request: R1104260
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 00:02	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/ 7/11	8/13/11 00:02	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 00:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104260-MB4

Service Request: R1104260
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 00:14	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/ 7/11	8/13/11 00:14	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	8/ 7/11	8/13/11 00:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/3/11 14:19

Sample Name: Method Blank
 Lab Code: RQ1107469-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\080311\D3810.D\

Analysis Lot: 255971
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/3/11 14:19

Sample Name: Method Blank
Lab Code: RQ1107469-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080311\D3810.D\

Analysis Lot: 255971
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/3/11 14:19	
Dibromofluoromethane	108	89-119	8/3/11 14:19	
Toluene-d8	112	87-121	8/3/11 14:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/4/11 12:40

Sample Name: Method Blank
Lab Code: RQ1107521-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3828.D\

Analysis Lot: 256370
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/4/11 12:40

Sample Name: Method Blank
Lab Code: RQ1107521-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\080411\D3828.D\

Analysis Lot: 256370
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	8/4/11 12:40	
Dibromofluoromethane	110	89-119	8/4/11 12:40	
Toluene-d8	113	87-121	8/4/11 12:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/5/11 12:11

Sample Name: Method Blank
 Lab Code: RQ1107482-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080511\J2621.D\

Analysis Lot: 256234
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	13 J	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	20 U	20	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/5/11 12:11

Sample Name: Method Blank
Lab Code: RQ1107482-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080511\J2621.D\

Analysis Lot: 256234
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 12:11	
Dibromofluoromethane	104	89-119	8/5/11 12:11	
Toluene-d8	109	87-121	8/5/11 12:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/5/11 13:34

Sample Name: Method Blank
 Lab Code: RQ1107489-03

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8425.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	3.2	J	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/5/11 13:34

Sample Name: Method Blank
Lab Code: RQ1107489-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\18425.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 13:34	
Dibromofluoromethane	103	89-119	8/5/11 13:34	
Toluene-d8	99	87-121	8/5/11 13:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/8/11 14:05

Sample Name: Method Blank
 Lab Code: RQ1107573-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2644.D\

Analysis Lot: 256488
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/8/11 14:05

Sample Name: Method Blank
Lab Code: RQ1107573-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080811\J2644.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/8/11 14:05	
Dibromofluoromethane	103	89-119	8/8/11 14:05	
Toluene-d8	106	87-121	8/8/11 14:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/9/11 08:54

Sample Name: Method Blank
Lab Code: RQ1107769-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star777.run

Analysis Lot: 257087
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/9/11 15:00

Sample Name: Method Blank
Lab Code: RQ1107770-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star802.run

Analysis Lot: 257088
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/10/11 10:10

Sample Name: Method Blank
Lab Code: RQ1107801-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star815.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/12/11 11:22

Sample Name: Method Blank
Lab Code: RQ1107802-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081211\X0006034.D\

Analysis Lot: 257191
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: NA
Date Received: NA
Date Analyzed: 8/15/11 14:14

Sample Name: Method Blank
Lab Code: RQ1107913-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081511\X0006078.D\

Analysis Lot: 257563
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/9/11

Replicate Sample Summary
 General Chemistry Parameters

Sample Name: LC34-RW0008-052.0-20110801
 Lab Code: R1104260-003

Units: mg/L
 Basis: NA

LC34-RW0008-052.0
 -20110801DUP

Duplicate Sample

R1104260-003DUP1

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Carbon, Total Organic (TOC), Average	9060A	5.0	73.1	73.4	73.2	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/1/11
Date Received: 8/2/11
Date Analyzed: 8/ 9/11

Matrix Spike Summary
General Chemistry Parameters

Sample Name: LC34-RW0008-052.0-20110801
Lab Code: R1104260-003

Units: mg/L
Basis: NA

Analytical Method: 9060A

LC34-RW0008-052.0-20110801
MS
Matrix Spike
R1104260-003MS1

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	73.1	121	50.0	95	62 - 135

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/1/11
Date Received: 8/2/11
Date Analyzed: 8/9/11 - 8/16/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Units: mg/L
Basis: NA

LC34-BW0001E-052.
 5-20110801DUP

Duplicate Sample

R1104260-021DUP5

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Iodide	300.0	2.0	2.0 U	2.0 U	NC	NC	20
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	183	183	183	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/1/11
Date Received: 8/2/11
Date Analyzed: 8/9/11 - 8/16/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001E-052.5-20110801
Lab Code: R1104260-021

Units: mg/L
Basis: NA

LC34-BW0001E-052.5-20
 110801MS
Matrix Spike
 R1104260-021MS5

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO ₃ , Total	SM 2320 B	183	268	83.3	102	70 - 110
Iodide	300.0	ND	10.3	10.0	103	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/1/11
Date Received: 8/2/11
Date Analyzed: 8/2/11 - 8/3/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001F-059.5-20110801
Lab Code: R1104260-023

Units: mg/L
Basis: NA

LC34-BW0001F-059.
 5-20110801DUP

Duplicate Sample

R1104260-023DUP6

Analyte Name	Method	MRL	Sample Result	Result	Average	RPD	RPD Limit
Bromide	300.0	1.0	26.9	26.3	26.6	2	20
Chloride	300.0	40	409	406	407	<1	20
Nitrate as Nitrogen	300.0	1.0	1.0 U	1.0 U	NC	NC	20
Sulfate	300.0	2.0	45.7	45.4	45.6	<1	20
Nitrite as Nitrogen	300.0	20	20 U	20 U	NC	NC	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/2/11 - 8/3/11

Matrix Spike Summary
 General Chemistry Parameters

Sample Name: LC34-BW0001F-059.5-20110801
 Lab Code: R1104260-023

Units: mg/L
 Basis: NA

Analytical Method: 300.0

LC34-BW0001F-059.5-201108
 01MS
 Matrix Spike
 R1104260-023MS6

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	26.9	36.0	10.0	91	90 - 110
Chloride	409	805	400	99	90 - 110
Nitrate as Nitrogen	ND	10.0	10.0	100	90 - 110
Nitrite as Nitrogen	ND	205	200	103	90 - 110
Sulfate	45.7	64.5	20.0	94	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/12/11

Replicate Sample Summary
 Inorganic Parameters

Sample Name: LC34-BW0001B-031.5-20110801 Dissolved
 Lab Code: R1104260-016

Units: µg/L
 Basis: NA

LC34-BW0001B-031.
 5-20110801
 DissolvedDUP

Duplicate Sample

R1104260-016DUP

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Arsenic, Dissolved	6010C	10	10 U	10 U	NC	NC	20
Iron, Dissolved	6010C	100	100 U	100 U	NC	NC	20
Manganese, Dissolved	6010C	10	28	27	27.6	2	20

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/12/11

Matrix Spike Summary
 Inorganic Parameters

Sample Name: LC34-BW0001B-031.5-20110801 Dissolved
 Lab Code: R1104260-016

Units: µg/L
 Basis: NA

Analytical Method: 6010C
 Prep Method: EPA 3010A

LC34-BW0001B-031.5-201108
 01 DissolvedMS
 Matrix Spike
 R1104260-016MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	ND	44.9	40	112	75 - 125
Iron, Dissolved	ND	1050	1000	105	75 - 125
Manganese, Dissolved	28	534	500	101	75 - 125

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Collected: 8/1/11
Date Received: 8/2/11
Date Analyzed: 8/5/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0002D1-052.5-20110801
Lab Code: R1104260-009

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IW0002D1-052.5-201108 LC34-IW0002D1-052.5-201108

01MS

01DMS

Matrix Spike
RQ1107482-05

Duplicate Matrix Spike
RQ1107482-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane (TCA)	ND	2380	2500	95	2040	2500	82	76 - 142	15	30
1,1,2,2-Tetrachloroethane	ND	2280	2500	91	2370	2500	95	71 - 120	4	30
1,1,2-Trichloroethane	ND	2390	2500	96	2390	2500	95	80 - 119	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	520	2830	2500	92	2250	2500	69	65 - 154	23	30
1,1-Dichloroethane (1,1-DCA)	ND	2530	2500	101	2310	2500	92	79 - 134	9	30
1,1-Dichloroethene (1,1-DCE)	ND	2380	2500	95	2130	2500	85	71 - 143	11	30
1,2,4-Trichlorobenzene	ND	3120	2500	125 *	3020	2500	121 *	75 - 118	3	30
1,2-Dibromo-3-chloropropane (DBC)	ND	2380	2500	95	2460	2500	98	60 - 125	3	30
1,2-Dibromoethane	ND	2370	2500	95	2450	2500	98	78 - 119	3	30
1,2-Dichlorobenzene	ND	2550	2500	102	2470	2500	99	82 - 117	3	30
1,2-Dichloroethane	ND	2460	2500	99	2400	2500	96	73 - 133	3	30
1,2-Dichloropropane	ND	2520	2500	101	2390	2500	96	84 - 124	5	30
1,3-Dichlorobenzene	ND	2600	2500	104	2480	2500	99	82 - 117	5	30
1,4-Dichlorobenzene	ND	2630	2500	105	2550	2500	102	81 - 116	3	30
n-Butanol	ND	127000	125000	102	160000	125000	128	50 - 150	23	30
2-Butanone (MEK)	ND	2030	2500	81	2160	2500	86	54 - 130	6	30
2-Hexanone	ND	2100	2500	84	2260	2500	90	55 - 125	7	30
4-Methyl-2-pentanone	ND	2260	2500	90	2510	2500	100	59 - 131	10	30
Acetone	ND	2140	2500	86	2110	2500	84	37 - 152	2	30
Benzene	ND	2440	2500	98	2260	2500	90	81 - 124	8	30
Bromodichloromethane	ND	2450	2500	98	2390	2500	95	81 - 126	3	30
Bromoform	ND	2330	2500	93	2410	2500	96	61 - 126	3	30
Bromomethane	ND	2140	2500	86	2120	2500	85	45 - 154	<1	30
Carbon Disulfide	ND	2510	2500	100	2390	2500	96	32 - 149	5	30
Carbon Tetrachloride	ND	2490	2500	100	2070	2500	83	71 - 146	18	30
Chlorobenzene	ND	2410	2500	96	2290	2500	92	80 - 125	5	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/ 5/11

Matrix Spike Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0002D1-052.5-20110801
 Lab Code: R1104260-009

Units: µg/L
 Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-IW0002D1-052.5-201108 01MS Matrix Spike RQ1107482-05			LC34-IW0002D1-052.5-201108 01DMS Duplicate Matrix Spike RQ1107482-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chloroethane	ND	2680	2500	107	2450	2500	98	68 - 148	9	30
Chloroform	ND	2450	2500	98	2300	2500	92	81 - 131	6	30
Chloromethane	ND	2740	2500	110	2490	2500	100	61 - 151	10	30
Cyclohexane	ND	2960	2500	118	2780	2500	111	59 - 144	6	30
Dibromochloromethane	ND	2400	2500	96	2450	2500	98	74 - 130	2	30
Dichlorodifluoromethane (CFC 12)	ND	3000	2500	120	2640	2500	106	44 - 175	13	30
Dichloromethane	ND	2360	2500	94	2350	2500	94	78 - 125	<1	30
Ethylbenzene	ND	2480	2500	99	2260	2500	90	84 - 127	9	30
Isopropylbenzene (Cumene)	ND	2790	2500	112	2410	2500	96	82 - 140	15	30
Methyl Acetate	ND	2180	2500	87	2240	2500	90	38 - 156	3	30
Methyl tert-Butyl Ether	ND	2190	2500	87	2190	2500	88	75 - 126	<1	30
Methylcyclohexane	ND	2960	2500	119	2890	2500	116	63 - 141	2	30
Styrene	ND	2450	2500	98	2360	2500	94	43 - 146	4	30
Tetrachloroethene (PCE)	ND	2550	2500	102	2240	2500	90	66 - 142	13	30
Toluene	ND	2480	2500	99	2290	2500	92	81 - 125	8	30
Trichloroethene (TCE)	1300	3510	2500	87	3200	2500	75	71 - 133	9	30
Trichlorofluoromethane (CFC 11)	ND	2540	2500	102	2130	2500	85	71 - 159	18	30
Vinyl Chloride	1900	4170	2500	90	3810	2500	76	72 - 154	9	30
cis-1,2-Dichloroethene	7500	8930	2500	58 *	8560	2500	43 *	72 - 137	4	30
cis-1,3-Dichloropropene	ND	2340	2500	94	2290	2500	92	71 - 120	2	30
m,p-Xylenes	ND	5020	5000	100	4550	5000	91	80 - 129	10	30
n-Butyl Acetate	690	2870	2500	87	2960	2500	91	18 - 159	3	30
o-Xylene	ND	2470	2500	99	2310	2500	93	80 - 126	7	30
trans-1,2-Dichloroethene	ND	2440	2500	98	2210	2500	88	77 - 130	10	30
trans-1,3-Dichloropropene	ND	2270	2500	91	2270	2500	91	67 - 122	<1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/16/11

Matrix Spike Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-IW0002I-027.5-20110801
 Lab Code: R1104260-005

Units: mg/L
 Basis: NA

Analytical Method: Organic Acids

Analyte Name	Sample Result	LC34-IW0002I-027.5-20110801 MS Matrix Spike RQ1107913-04			LC34-IW0002I-027.5-20110801 DMS Duplicate Matrix Spike RQ1107913-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	5.55	5.00	111	5.45	5.00	109	25 - 152	2	30
Acetic Acid	610	671	50.0	129 #	658	50.0	104 #	13 - 167	2	30
Butanoic Acid (Butyric Acid)	210	255	50.0	80 #	254	50.0	79 #	49 - 145	<1	30
Lactic Acid	ND	47.4	49.9	95	47.7	49.9	96	27 - 127	<1	30
Propionic Acid	ND	50.3	49.8	101	50.6	49.8	102	68 - 133	<1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Collected: 8/1/11
 Date Received: 8/2/11
 Date Analyzed: 8/10/11

Matrix Spike Summary
 Dissolved Gases by GC/FID

Sample Name: LC34-IW0002D-037.5-20110801
 Lab Code: R1104260-007

Units: µg/L
 Basis: NA

Analytical Method: RSK 175

Analyte Name	LC34-IW0002D-037.5-2011080 1MS Matrix Spike RQ1107801-03				LC34-IW0002D-037.5-2011080 1DMS Duplicate Matrix Spike RQ1107801-04			% Rec Limits	RPD	RPD Limit
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	48	106	52.1	111	98.6	52.1	98	57 - 133	7	30
Ethene	28	80.6	48.6	108	75.9	48.6	99	58 - 135	6	30
Methane	43	97.2	52.5	103	95.3	52.5	99	47 - 146	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS1			Duplicate Lab Control Sample R1104260-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.49	5.2	105	5.61	5.2	107	56 - 138	2	20

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 2/11 -
 8/16/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.09	1.00	109	90 - 110
Chloride	300.0	1.98	2.00	99	90 - 110
Iodide	300.0	1.04	1.00	104	90 - 110
Nitrate as Nitrogen	300.0	1.09	1.00	109	90 - 110
Sulfate	300.0	2.12	2.00	106	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.0	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.3	10.0	103	86 - 117
Nitrite as Nitrogen	300.0	1.03	1.00	103	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 2/11 -
 8/16/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.04	1.00	104	90 - 110
Chloride	300.0	2.00	2.00	100	90 - 110
Iodide	300.0	1.02	1.00	102	90 - 110
Nitrate as Nitrogen	300.0	1.07	1.00	107	90 - 110
Sulfate	300.0	2.10	2.00	105	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	944	1000	94	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.94	10.0	99	86 - 117
Nitrite as Nitrogen	300.0	1.04	1.00	104	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/3/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS4			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.05	1.00	105	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS5			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.06	1.00	106	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/12/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1104260-LCS1

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Arsenic, Dissolved	6010C	36.7	40	92	80 - 120	
Iron, Dissolved	6010C	987	1000	99	80 - 120	
Manganese, Dissolved	6010C	501	500	100	80 - 120	

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/13/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104260-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Arsenic, Dissolved	6010C	37.3	40	93	80 - 120
Iron, Dissolved	6010C	1000	1000	100	80 - 120
Manganese, Dissolved	6010C	507	500	101	80 - 120

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 255971

**Lab Control Sample
 RQ1107469-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.6	20.0	103	72 - 128
1,1,2,2-Tetrachloroethane	19.8	20.0	99	72 - 131
1,1,2-Trichloroethane	19.7	20.0	99	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.5	20.0	107	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.2	20.0	106	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.4	20.0	107	72 - 129
1,2,4-Trichlorobenzene	19.7	20.0	98	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.2	20.0	91	62 - 131
1,2-Dibromoethane	19.5	20.0	97	78 - 125
1,2-Dichlorobenzene	19.9	20.0	100	79 - 124
1,2-Dichloroethane	21.0	20.0	105	73 - 127
1,2-Dichloropropane	20.9	20.0	104	80 - 123
1,3-Dichlorobenzene	19.6	20.0	98	78 - 124
1,4-Dichlorobenzene	19.7	20.0	98	78 - 123
n-Butanol	1010	1000	101	70 - 130
2-Butanone (MEK)	19.5	20.0	97	60 - 133
2-Hexanone	18.0	20.0	90	61 - 131
4-Methyl-2-pentanone	18.4	20.0	92	61 - 132
Acetone	23.0	20.0	115	54 - 139
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	21.0	20.0	105	80 - 125
Bromoform	19.2	20.0	96	68 - 130
Bromomethane	18.1	20.0	91	57 - 144
Carbon Disulfide	12.4	20.0	62	52 - 140
Carbon Tetrachloride	21.1	20.0	106	68 - 133
Chlorobenzene	20.0	20.0	100	80 - 121
Chloroethane	24.6	20.0	123	71 - 130
Chloroform	21.4	20.0	107	78 - 125
Chloromethane	21.4	20.0	107	61 - 138
Cyclohexane	12.5	20.0	63	57 - 126
Dibromochloromethane	20.1	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	18.2	20.0	91	45 - 159

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Analyzed: 8/ 3/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 255971

Lab Control Sample
 RQ1107469-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.2	20.0	101	75 - 125
Ethylbenzene	20.3	20.0	102	78 - 123
Isopropylbenzene (Cumene)	22.5	20.0	113	73 - 133
Methyl Acetate	21.2	20.0	106	57 - 157
Methyl tert-Butyl Ether	19.2	20.0	96	75 - 126
Methylcyclohexane	12.5	20.0	62	61 - 125
Styrene	20.4	20.0	102	80 - 132
Tetrachloroethene (PCE)	20.0	20.0	100	72 - 131
Toluene	20.5	20.0	103	78 - 122
Trichloroethene (TCE)	20.1	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	23.7	20.0	119	69 - 141
Vinyl Chloride	24.1	20.0	120	72 - 138
cis-1,2-Dichloroethene	21.2	20.0	106	78 - 122
cis-1,3-Dichloropropene	19.8	20.0	99	77 - 125
m,p-Xylenes	41.6	40.0	104	79 - 126
n-Butyl Acetate	17.7	20.0	88	31 - 144
o-Xylene	20.3	20.0	102	77 - 118
trans-1,2-Dichloroethene	20.5	20.0	102	75 - 121
trans-1,3-Dichloropropene	19.8	20.0	99	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 256370

**Lab Control Sample
 RQ1107521-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.3	20.0	97	72 - 128
1,1,2,2-Tetrachloroethane	19.8	20.0	99	72 - 131
1,1,2-Trichloroethane	19.6	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.0	20.0	105	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.5	20.0	102	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.4	20.0	102	72 - 129
1,2,4-Trichlorobenzene	18.9	20.0	95	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.5	20.0	92	62 - 131
1,2-Dibromoethane	19.5	20.0	98	78 - 125
1,2-Dichlorobenzene	19.4	20.0	97	79 - 124
1,2-Dichloroethane	21.1	20.0	106	73 - 127
1,2-Dichloropropane	20.4	20.0	102	80 - 123
1,3-Dichlorobenzene	19.0	20.0	95	78 - 124
1,4-Dichlorobenzene	19.1	20.0	95	78 - 123
n-Butanol	1050	1000	105	70 - 130
2-Butanone (MEK)	18.5	20.0	93	60 - 133
2-Hexanone	17.1	20.0	85	61 - 131
4-Methyl-2-pentanone	17.2	20.0	86	61 - 132
Acetone	18.2	20.0	91	54 - 139
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	20.6	20.0	103	80 - 125
Bromoform	19.0	20.0	95	68 - 130
Bromomethane	14.5	20.0	72	57 - 144
Carbon Disulfide	19.1	20.0	96	52 - 140
Carbon Tetrachloride	20.2	20.0	101	68 - 133
Chlorobenzene	19.5	20.0	98	80 - 121
Chloroethane	23.9	20.0	119	71 - 130
Chloroform	21.0	20.0	105	78 - 125
Chloromethane	20.1	20.0	100	61 - 138
Cyclohexane	20.2	20.0	101	57 - 126
Dibromochloromethane	20.3	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	17.2	20.0	86	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 256370

**Lab Control Sample
 RQ1107521-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.8	20.0	99	75 - 125
Ethylbenzene	19.5	20.0	97	78 - 123
Isopropylbenzene (Cumene)	21.3	20.0	106	73 - 133
Methyl Acetate	20.7	20.0	103	57 - 157
Methyl tert-Butyl Ether	19.2	20.0	96	75 - 126
Methylcyclohexane	20.0	20.0	100	61 - 125
Styrene	20.0	20.0	100	80 - 132
Tetrachloroethene (PCE)	18.9	20.0	95	72 - 131
Toluene	19.5	20.0	97	78 - 122
Trichloroethene (TCE)	19.4	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	23.2	20.0	116	69 - 141
Vinyl Chloride	23.0	20.0	115	72 - 138
cis-1,2-Dichloroethene	20.7	20.0	104	78 - 122
cis-1,3-Dichloropropene	19.3	20.0	97	77 - 125
m,p-Xylenes	40.2	40.0	101	79 - 126
n-Butyl Acetate	18.6	20.0	93	31 - 144
o-Xylene	19.6	20.0	98	77 - 118
trans-1,2-Dichloroethene	19.2	20.0	96	75 - 121
trans-1,3-Dichloropropene	19.3	20.0	97	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256234

**Lab Control Sample
 RQ1107482-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.9	20.0	105	72 - 128
1,1,2,2-Tetrachloroethane	18.9	20.0	95	72 - 131
1,1,2-Trichloroethane	19.9	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	22.8	20.0	114	68 - 136
1,1-Dichloroethane (1,1-DCA)	22.7	20.0	114	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.4	20.0	107	72 - 129
1,2,4-Trichlorobenzene	27.2	20.0	136 *	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.1	20.0	95	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	22.5	20.0	113	79 - 124
1,2-Dichloroethane	20.4	20.0	102	73 - 127
1,2-Dichloropropane	22.0	20.0	110	80 - 123
1,3-Dichlorobenzene	23.9	20.0	120	78 - 124
1,4-Dichlorobenzene	23.8	20.0	119	78 - 123
n-Butanol	1200	1000	120	70 - 130
2-Butanone (MEK)	15.4	20.0	77	60 - 133
2-Hexanone	15.3	20.0	76	61 - 131
4-Methyl-2-pentanone	15.8	20.0	79	61 - 132
Acetone	16.7	20.0	84	54 - 139
Benzene	21.4	20.0	107	78 - 121
Bromodichloromethane	20.8	20.0	104	80 - 125
Bromoform	19.7	20.0	98	68 - 130
Bromomethane	19.3	20.0	97	57 - 144
Carbon Disulfide	18.1	20.0	90	52 - 140
Carbon Tetrachloride	21.9	20.0	109	68 - 133
Chlorobenzene	22.2	20.0	111	80 - 121
Chloroethane	23.8	20.0	119	71 - 130
Chloroform	21.3	20.0	106	78 - 125
Chloromethane	23.5	20.0	117	61 - 138
Cyclohexane	21.8	20.0	109	57 - 126
Dibromochloromethane	21.2	20.0	106	78 - 133
Dichlorodifluoromethane (CFC 12)	26.5	20.0	133	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256234

**Lab Control Sample
 RQ1107482-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.8	20.0	104	75 - 125
Ethylbenzene	23.5	20.0	118	78 - 123
Isopropylbenzene (Cumene)	26.3	20.0	132	73 - 133
Methyl Acetate	16.4	20.0	82	57 - 157
Methyl tert-Butyl Ether	17.8	20.0	89	75 - 126
Methylcyclohexane	22.4	20.0	112	61 - 125
Styrene	22.2	20.0	111	80 - 132
Tetrachloroethene (PCE)	24.7	20.0	124	72 - 131
Toluene	22.9	20.0	114	78 - 122
Trichloroethene (TCE)	21.9	20.0	109	74 - 127
Trichlorofluoromethane (CFC 11)	22.9	20.0	114	69 - 141
Vinyl Chloride	24.9	20.0	125	72 - 138
cis-1,2-Dichloroethene	22.3	20.0	112	78 - 122
cis-1,3-Dichloropropene	20.6	20.0	103	77 - 125
m,p-Xylenes	47.3	40.0	118	79 - 126
n-Butyl Acetate	17.5	20.0	88	31 - 144
o-Xylene	23.1	20.0	116	77 - 118
trans-1,2-Dichloroethene	21.3	20.0	107	75 - 121
trans-1,3-Dichloropropene	20.0	20.0	100	69 - 127

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256275

Analyte Name	Lab Control Sample RQ1107489-04			Duplicate Lab Control Sample RQ1107489-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	19.7	20.0	99	17.8	20.0	89	72 - 128	10	30
1,1,2,2-Tetrachloroethane	20.7	20.0	103	20.5	20.0	103	72 - 131	<1	30
1,1,2-Trichloroethane	21.3	20.0	106	21.3	20.0	107	80 - 122	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	18.0	20.0	90	16.4	20.0	82	68 - 136	9	30
1,1-Dichloroethane (1,1-DCA)	21.7	20.0	109	20.9	20.0	105	76 - 124	4	30
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	93	18.1	20.0	91	72 - 129	3	30
1,2,4-Trichlorobenzene	19.1	20.0	96	18.8	20.0	94	70 - 133	2	30
1,2-Dibromo-3-chloropropane (DBCP)	17.5	20.0	88	19.3	20.0	97	62 - 131	10	30
1,2-Dibromoethane	20.1	20.0	100	20.2	20.0	101	78 - 125	<1	30
1,2-Dichlorobenzene	19.5	20.0	98	19.6	20.0	98	79 - 124	<1	30
1,2-Dichloroethane	20.6	20.0	103	19.7	20.0	99	73 - 127	4	30
1,2-Dichloropropane	23.6	20.0	118	23.1	20.0	115	80 - 123	2	30
1,3-Dichlorobenzene	19.0	20.0	95	18.9	20.0	94	78 - 124	<1	30
1,4-Dichlorobenzene	19.6	20.0	98	19.2	20.0	96	78 - 123	2	30
n-Butanol	1140	1000	114	1210	1000	121	70 - 130	6	30
2-Butanone (MEK)	20.3	20.0	102	21.4	20.0	107	60 - 133	5	30
2-Hexanone	19.2	20.0	96	19.6	20.0	98	61 - 131	2	30
4-Methyl-2-pentanone	18.9	20.0	95	19.6	20.0	98	61 - 132	4	30
Acetone	20.2	20.0	101	20.3	20.0	102	54 - 139	<1	30
Benzene	21.9	20.0	109	20.7	20.0	104	78 - 121	5	30
Bromodichloromethane	20.4	20.0	102	19.9	20.0	100	80 - 125	2	30
Bromoform	18.0	20.0	90	17.7	20.0	88	68 - 130	2	30
Bromomethane	16.4	20.0	82	15.2	20.0	76	57 - 144	8	30
Carbon Disulfide	19.9	20.0	99	19.4	20.0	97	52 - 140	3	30
Carbon Tetrachloride	18.9	20.0	95	17.0	20.0	85	68 - 133	10	30
Chlorobenzene	20.3	20.0	102	20.1	20.0	100	80 - 121	1	30
Chloroethane	23.4	20.0	117	21.8	20.0	109	71 - 130	7	30
Chloroform	20.7	20.0	103	19.9	20.0	100	78 - 125	4	30
Chloromethane	21.3	20.0	107	19.9	20.0	99	61 - 138	7	30
Cyclohexane	20.4	20.0	102	24.3	20.0	121	57 - 126	17	30
Dibromochloromethane	18.9	20.0	95	18.6	20.0	93	78 - 133	2	30
Dichlorodifluoromethane (CFC 12)	18.8	20.0	94	17.9	20.0	89	45 - 159	5	30

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256275

Analyte Name	Lab Control Sample RQ1107489-04			Duplicate Lab Control Sample RQ1107489-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	20.3	20.0	102	19.1	20.0	96	75 - 125	6	30
Ethylbenzene	21.0	20.0	105	19.6	20.0	98	78 - 123	7	30
Isopropylbenzene (Cumene)	21.7	20.0	109	20.6	20.0	103	73 - 133	5	30
Methyl Acetate	19.5	20.0	98	19.9	20.0	99	57 - 157	2	30
Methyl tert-Butyl Ether	20.3	20.0	101	20.0	20.0	100	75 - 126	1	30
Methylcyclohexane	18.8	20.0	94	22.0	20.0	110	61 - 125	16	30
Styrene	20.4	20.0	102	20.2	20.0	101	80 - 132	1	30
Tetrachloroethene (PCE)	19.3	20.0	97	18.2	20.0	91	72 - 131	6	30
Toluene	21.0	20.0	105	19.6	20.0	98	78 - 122	7	30
Trichloroethene (TCE)	20.8	20.0	104	19.1	20.0	96	74 - 127	8	30
Trichlorofluoromethane (CFC 11)	20.2	20.0	101	19.2	20.0	96	69 - 141	5	30
Vinyl Chloride	25.6	20.0	128	23.2	20.0	116	72 - 138	10	30
cis-1,2-Dichloroethene	21.1	20.0	105	20.2	20.0	101	78 - 122	4	30
cis-1,3-Dichloropropene	20.0	20.0	100	19.7	20.0	98	77 - 125	2	30
m,p-Xylenes	41.6	40.0	104	39.8	40.0	99	79 - 126	4	30
n-Butyl Acetate	18.3	20.0	92	19.6	20.0	98	31 - 144	7	30
o-Xylene	20.7	20.0	103	20.2	20.0	101	77 - 118	2	30
trans-1,2-Dichloroethene	20.5	20.0	102	18.9	20.0	95	75 - 121	8	30
trans-1,3-Dichloropropene	19.0	20.0	95	18.5	20.0	93	69 - 127	3	30

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256488

**Lab Control Sample
 RQ1107573-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.5	20.0	87	72 - 128
1,1,2,2-Tetrachloroethane	16.4	20.0	82	72 - 131
1,1,2-Trichloroethane	17.3	20.0	87	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.6	20.0	93	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.3	20.0	96	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	94	72 - 129
1,2,4-Trichlorobenzene	22.7	20.0	113	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	17.3	20.0	87	78 - 125
1,2-Dichlorobenzene	18.5	20.0	92	79 - 124
1,2-Dichloroethane	17.3	20.0	86	73 - 127
1,2-Dichloropropane	17.7	20.0	89	80 - 123
1,3-Dichlorobenzene	19.4	20.0	97	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
n-Butanol	1230	1000	123	70 - 130
2-Butanone (MEK)	15.8	20.0	79	60 - 133
2-Hexanone	15.2	20.0	76	61 - 131
4-Methyl-2-pentanone	15.9	20.0	79	61 - 132
Acetone	17.2	20.0	86	54 - 139
Benzene	17.6	20.0	88	78 - 121
Bromodichloromethane	17.0	20.0	85	80 - 125
Bromoform	16.8	20.0	84	68 - 130
Bromomethane	17.1	20.0	85	57 - 144
Carbon Disulfide	19.2	20.0	96	52 - 140
Carbon Tetrachloride	18.0	20.0	90	68 - 133
Chlorobenzene	18.0	20.0	90	80 - 121
Chloroethane	20.1	20.0	101	71 - 130
Chloroform	17.9	20.0	90	78 - 125
Chloromethane	19.7	20.0	99	61 - 138
Cyclohexane	21.3	20.0	106	57 - 126
Dibromochloromethane	18.1	20.0	91	78 - 133
Dichlorodifluoromethane (CFC 12)	22.6	20.0	113	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC24 TR0272
 Sample Matrix: Water

Service Request: R1104260
 Date Analyzed: 8/ 8/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 256488

Lab Control Sample
 RQ1107573-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.9	20.0	89	75 - 125
Ethylbenzene	18.7	20.0	93	78 - 123
Isopropylbenzene (Cumene)	21.2	20.0	106	73 - 133
Methyl Acetate	15.9	20.0	79	57 - 157
Methyl tert-Butyl Ether	16.2	20.0	81	75 - 126
Methylcyclohexane	22.0	20.0	110	61 - 125
Styrene	18.3	20.0	91	80 - 132
Tetrachloroethene (PCE)	20.5	20.0	102	72 - 131
Toluene	18.7	20.0	94	78 - 122
Trichloroethene (TCE)	17.5	20.0	87	74 - 127
Trichlorofluoromethane (CFC 11)	19.6	20.0	98	69 - 141
Vinyl Chloride	21.6	20.0	108	72 - 138
cis-1,2-Dichloroethene	19.1	20.0	95	78 - 122
cis-1,3-Dichloropropene	17.2	20.0	86	77 - 125
m,p-Xylenes	38.0	40.0	95	79 - 126
n-Butyl Acetate	17.5	20.0	87	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	18.5	20.0	93	75 - 121
trans-1,3-Dichloropropene	16.7	20.0	84	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/9/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 257087

Lab Control Sample
RQ1107769-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	28.5	26.1	109	56 - 148
Ethene	23.8	24.3	98	58 - 155
Methane	28.7	26.2	110	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/9/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 257088

Lab Control Sample
RQ1107770-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	28.9	26.1	111	56 - 148
Ethene	24.6	24.3	101	58 - 155
Methane	27.0	26.2	103	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/10/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 257189

Lab Control Sample
RQ1107801-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	25.0	26.1	96	56 - 148
Ethene	21.6	24.3	89	58 - 155
Methane	25.2	26.2	96	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/12/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 257191

Analyte Name	Lab Control Sample RQ1107802-02			Duplicate Lab Control Sample RQ1107802-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.29	1.00	129	1.24	1.00	124	70 - 130	4	30
Acetic Acid	8.73	10.0	87	9.05	10.0	91	70 - 135	4	30
Butanoic Acid (Butyric Acid)	7.88	10.0	79	8.65	10.0	86	78 - 113	9	30
Lactic Acid	10.1	9.97	102	10.0	9.97	100	61 - 109	1	30
Propionic Acid	8.11	9.97	81	8.81	9.97	88	80 - 125	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC24 TR0272
Sample Matrix: Water

Service Request: R1104260
Date Analyzed: 8/15/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 257563

Analyte Name	Lab Control Sample RQ1107913-02			Duplicate Lab Control Sample RQ1107913-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.17	1.00	117	1.16	1.00	116	70 - 130	<1	30
Acetic Acid	9.73	10.0	97	9.68	10.0	97	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.6	10.0	105	9.64	10.0	96	78 - 113	9	30
Lactic Acid	9.38	9.97	94	9.30	9.97	93	61 - 109	<1	30
Propionic Acid	9.15	9.97	92	9.37	9.97	94	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEES (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-201108 01	8/01/2011	1052	001,002	W	16	3	2	1	3	1	3	1	1	1	
LC34-RW0008-052.0-201108 01	8/01/2011	0454	003,004	W	16	3	2	1	3	1	3	1	1	1	
LC34-IW0002I-027.5-201108 01	8/01/2011	1408	005,006	W	16	3	2	1	3	1	3	1	1	1	
LC34-IW0002D-037.5-201108 01	8/01/2011	1315	007,008	W	16	3	2	1	3	1	3	1	1	1	- For VOC, only 2/2
LC34-IW0002D1-052.5-201108 01	8/01/2011	1142	009,010	W	16	3	2	1	3	1	3	1	1	1	vials filled.
LC34-IW0076-075.0-201108 01	8/01/2011	1501	011,012	W	13	3	2	1	3		3				
LC34-BW0001A-024.5-201108 01	8/01/2011	1226	013,014	W	16	3	2	1	3	1	3	1	1	1	- For VOC, only 2
LC34-BW0001B-031.5-201108 01	8/01/2011	1137	015,016	W	16	3	2	1	3	1	3	1	1	1	vials filled.
LC34-BW0001C-038.5-201108 01	8/01/2011	1054	017,018	W	16	3	2	1	3	1	3	1	1	1	2017 results not rec'd
LC34-BW0001D-045.5-201108 01	8/01/2011	1324	019,020	W	16	3	2	1	3	1	3	1	1	1	US 8/31/11

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____


REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling.
 please filter in lab

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Josiah Barrett
 Firm: GEOSYNTEC
 Date/Time: 08/01/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: FEDDEX
 Firm: _____
 Date/Time: _____

R11104260
 GeoSyntec Consultants
 ESTCP PED LC24 TR0272



RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Culture
 Firm: CAS
 Date/Time: 8/2/11 1005

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEES (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0001E-052.5-20110801	8/01/2011	1421	-021, 022	W	16	3	2	1	3	1	3	1	1	1	
LC34-BW0001F-059.5-20110801	8/01/2011	1509	-023, 024	W	16	3	2	1	3	1	3	1	1	1	
LC34-BW0002A-024.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	JB.
LC34-BW0002B-031.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0002C-038.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0002D-045.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0002E-052.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0002F-059.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0002G-067.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	
LC34-BW0003B-031.5-201108	8/01/2011			W	12	3	2	1	3	1	3	1	1	1	

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filler in lab

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Barstlett
 Firm: Geosyntec
 Date/Time: 08/01/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barstlett
 Firm: Geosyntec
 Date/Time: 08/01/11 - 1700

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Sherry LaFon
 Firm: CAS
 Date/Time: 8/2/11 1005

R1104260
 GeoSyntec Consultants
 ESTCP PED LC24 TR0272



Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0003C-038.5-201108	8/1/2011			W	15	3	2	1	3	1	3	1	1		
LC34-BW0003D-045.5-201108	8/1/2011			W	12	3	2	1	3		3				JB
LC34-BW0003E-052.5-201108	8/1/2011			W	12	3	2	1	3		3				
LC34-BW0003F-059.5-201108	8/1/2011			W	12	3	2	1	3		3				
LC34-RW0007-038.5-201108 01-D	8/01/2011	1052	-025	W	3	3									
LC34-IW0002I-027.5-201108 01-D	8/01/2011	1408	-026	W	3	3									
LC34-IW0002D-037.5-201108 01-D	8/01/2011	1315	-027	W	2	2									
LC34-BW0001B-031.5-201108 01-D	8/01/2011	1137	-028	W	1	1		1							
LC34-BW0001D-045.5-201108 01-D	8/01/2011	1324	-029	W	1	1						1			
LC34-BW0002D-045.5-201108 01-D	8/1/2011			W	3	3									

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling.
 please filter in lab.

RELINQUISHED BY: [Signature]
 Signature: Joseph Bartlett
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 08/01/11 1700

RECEIVED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY: _____
 Signature: [Signature]
 Printed Name: _____
 Firm: CAD
 Date/Time: 8/2/11 1005

R1104260

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-BW0003B-031.5-201108-D	8/7/2011			W
LC34-BW0003C-038.5-201108-D	8/7/2011			W
LC34-RW0008-052.0-20110801-D	8/01/2011	0954	-030	W
LC34-IW0002D1-052.5-20110801-D	8/01/2011	1142	-031, 032	W
LC34-BW0002F-059.5-201108-D	8/7/2011			W
LC34-FD-20110801-01	8/01/2011	NA	-030 -033 ^{SP}	W
LC34-FD-20110801-03	8/01/2011	NA	-034	W
LC34-FD-20110801-04	8/01/2011	NA	-035	W
LC34-FD-20110801-05	8/01/2011	NA	-036	W
LC34-FD-20110801-06	8/01/2011	NA	-037	W

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Robertson
 Firm: Geosyntec
 Date/Time: 08/01/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: [Signature]
 Firm: [Signature]
 Date/Time: _____

Number of Containers: _____

VOCs (8260C) plus n-butyl acetate: _____

VFAs (300): _____

Bromide and Iodide (300.0): _____

TOC (9060A): _____

Sulfide (9060A): _____

MES (RSK 175): _____

Anions (300.0): _____

Alkalinity (310.1): _____

Dissolved Metals (6010B): _____

REMARKS
<u>SP</u>
<u>1</u>
<u>3</u>
<u>1</u>
<u>1</u>
<u>3</u>
<u>3</u>
<u>3</u>
<u>3</u>
<u>3</u>
<u>2</u>
<u>only 2 vials filled</u>

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Cheryll Latour
 Firm: CAI
 Date/Time: 8/2/11 1005

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

R1104260

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-201108-0	8/1/2011	NA		W	2		3								
LC34-FD-201108-01-0-9	8/01/2011	NA	-038	W	1			1							
LC34-FD-201108-0	8/1/2011	NA		W	1			1							
LC34-FD-201108-0	8/1/2011	NA		W	1			1							
LC34-FD-201108-01-0-2	8/01/2011	NA	-039, 041, 042	W	3				3						
LC34-FD-201108-0	8/1/2011	NA		W	3				3						
LC34-FD-201108-01-0-7	8/01/2011	NA	-040	W	1				1						
LC34-FD-201108-0	8/1/2011	NA		W	3						3				
LC34-FD-201108-0	8/1/2011	NA		W	3						3				
LC34-FD-201108-0	8/1/2011	NA		W	1							1			

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration)
 Summaries
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

INVOICE INFORMATION
 P.O. # _____
 Bill to: TR0272

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARNETT
 Firm: GEOSYNTEC
 Date/Time: 08/01/11 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Cutrone
 Firm: CAI
 Date/Time: 8/2/11 1205

21104260

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-201108-0	8/1/2011	NA		W	1										
LC34-FD-20110801-08	8/01/2011	NA	-041	W	1										
LC34-FB-201108	8/1/2011	NA		W	3										
LC34-TB-201108	8/1/2011	NA		W	3										
LC34-FB-201108	8/1/2011	NA		W	3										
TB #	8/1/11		-042		0										
					0										
					0										
					0										
					0										

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab
* added as per JTB phone call 8/21/11 KB
R1104260

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARRETT
 Firm: Geosyntec
 Date/Time: 08/01/11 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/01/11 1700

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Latrus
 Firm: CAS
 Date/Time: 8/2/11 1055

Cooler Receipt And Preservation Check Form

Project/Client Asyntra Folder Number R1104260

Cooler received on 8/2/11 by: AD COURIER: CAS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? CAS/ROC CLIENT
 - Temperature of cooler(s) upon receipt: 3.5° 4.0° 2.8° 2.5°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

mat rec'd broken for BW0001E-8260, BW0001B-max acid cap cracked for BW0001E but septa held it shut, new cap upon receipt

Date/Time Temperatures Taken: 8/2/11 1011
 Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: all noted on ack.
 PC Secondary Review: KB 8/2/11

Cooler Breakdown: Date: 8/2/11 Time: 1615 by: AD

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 - Did all bottle labels and tags agree with custody papers? YES NO
 - Were correct containers used for the tests indicated? YES NO
 - Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: did not receive RSK-175 for location BW0001C

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			WC103051F	2/16				
≤2	HNO ₃								
≤2	H ₂ SO ₄			WC103081D	4/12				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	WC103098C	5/12				
	HCl	*	*	H110060	7/12				

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 1-087-002, 1-045-004
 Other Comments:

** Alkalinity w/ bubbles - BW0001C, BW0001B, BW0001E, BW0001A, BW0001F, BW0001D
 Sulfide w/ bubbles - BW0001A, BW0001E, FD-20110801-07, BW0001B, BW0001C, BW0001D
 VOA - 1W00076 (1), RW00007 (1), FW00002 (1), Temp Blank (1), FD-20110801-05 (1), IW00002 (1), RW00007 (1), BW0001D (1), IW00002 (1), + BW0001B (1)*

PC Secondary Review: KB 8/3/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

August 25, 2011

Service Request No: R1104287

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 PED TR0272 8/2/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory between August 3, 2011 and August 5, 2011. For your reference, these analyses have been assigned our service request number **R1104287**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 139

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1104287
Date Received: 8/3,5/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-eight (28) water samples were collected by the client on 8/2-3/11 and were received for analysis at Columbia Analytical Services on 8/3/11 and 8/5/11 via a national courier. The samples were received at a cooler temperature range of 2.8-5.3°C within the guidelines of 0-6°C. Bubbles were noted in 1 of the 3 vials for samples noted on the Cooler Receipt and Preservation Check Form at the end of the report. No data was affected.

Organic Compounds

Eighteen (18) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. Fourteen (14) of these samples were also analyzed for GC Method RSK-175 and Organic Acids by HPLC.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except the Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Acetone (23.7%) on the 8/16/11 analytical run. All detected concentrations for this compound in samples associated with this CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report for 8260C and RSK-175. Site QC is included in the report for location LC34-BW0002A-024.5-201108 (CAS # R1104287-001). All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) and Laboratory Control Samples (LCS) and LCS Duplicate (RSK & Organic Acids) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All samples were initially analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Samples LC34-BW0002D-045.5-20110802-D (CAS #R1104287-013) and LC34-TB-20110803 (CAS #R1104287-028) were repeated outside of holding time due to possible carry over contamination in the initial runs. The -013 sample results were confirmed as reported on the initial run. The Trip Blank results did indicate carry over as the repeated sample had no hits. Only the initial data is included in the report as per the EDD requirements of only 1 set data to be reported.

The Laboratory Method Blanks were free from contamination except for Acetone which contained a low level hit on the 8/5/11 analytical run. Affected data is flagged as "B" in the report.

For the RSK analysis, there was a slight shift in Retention Time (RT) and poor peak shape (very broad instead of Gaussian) for ethane during the analysis of these samples. It appears that coelution is occurring, but we don't have the ability to differentiate between ethane and the co-eluting compound. The Ethane results may be biased high.

Approved by Keenan B. Bunker Date 8/31/11

The Primary Standard mix for RSK expired on 8/6/11. The Secondary Standard mix expired on 8/9/11. Both standards have shown little to no degradation over the past year. New standards have been ordered but not yet received.

No other analytical or QC problems were encountered.

Inorganic Parameters

Fourteen (14) water samples were analyzed for Bromide and Iodide by IC method 300.0, and TOC by 9060A. Three (3) of the samples were analyzed for Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0

All initial and continuing calibration criteria were met for these analyses.


Batch QC is included in the report for the Anions, Sulfide and Alkalinity. Site Specific QC is included for locations LC34-BW0002C-038.5-20110802 (CAS #R1104287-003) Br and SO₄, LC34-BW0003B-031.5-20110802 (CAS #R1104287-008) Br and I, and LC34-BW0003D-045.5-20110802 (CAS #R1104287-010) I. All Matrix Spike (MS) recoveries were acceptable except for Bromide (-003) and Iodide (-010). The recoveries have been flagged as "**". All Relative Percent Difference (RPD) calculations were acceptable. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104287

<u>Lab ID</u>	<u>Client ID</u>
R1104287-001	LC34-BW0002A-024.5-20110802
R1104287-002	LC34-BW0002B-031.5-20110802
R1104287-003	LC34-BW0002C-038.5-20110802
R1104287-004	LC34-BW0002D-045.5-20110802
R1104287-005	LC34-BW0002E-052.5-20110802
R1104287-006	LC34-BW0002F-059.5-20110802
R1104287-007	LC34-BW0003A-024.5-20110802
R1104287-008	LC34-BW0003B-031.5-20110802
R1104287-009	LC34-BW0003C-038.5-20110802
R1104287-010	LC34-BW0003D-045.5-20110802
R1104287-011	LC34-BW0003E-052.5-20110802
R1104287-012	LC34-BW0003F-059.5-20110802
R1104287-013	LC34-BW0002D-045.5-20110802-D
R1104287-014	LC34-BW0003B-031.5-20110802-D
R1104287-015	LC34-BW0003C-038.5-20110802-D
R1104287-016	LC34-BW0002F-059.5-20110802-D
R1104287-017	LC34-FD-20110802-08
R1104287-018	LC34-FD-20110802-05
R1104287-019	LC34-FD-20110802-06
R1104287-020	LC34-FD-20110802-03
R1104287-021	LC34-FD-20110802-07
R1104287-022	LC34-FD-20110802-02
R1104287-023	LC34-FD-20110802-01
R1104287-024	LC34-FD-20110802-04
R1104287-025	LC34-TB-20110802
R1104287-026	LC34-IDW183866-20110803
R1104287-027	LC34-IDW183865-20110803
R1104287-028	LC34-TB-20110803

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nebraska Accredited
Connecticut ID # PH0556	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
DoD ELAP #65817	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20110802
Lab Code: R1104287-001

Service Request: R1104287
Date Collected: 8/ 2/11 1103
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	8/5/11 18:29	
Carbon, Total Organic (TOC), Average	9060A	3.7	mg/L	1.0	1	NA	8/10/11 18:20	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 13:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1103
Date Received: 8/ 3/11
Date Analyzed: 8/5/11 17:06

Sample Name: LC34-BW0002A-024.5-20110802
Lab Code: R1104287-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8433.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	23000		1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	
106-93-4	1,2-Dibromoethane	1300	U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	50	
107-06-2	1,2-Dichloroethane	1300	U	1300	50	
78-87-5	1,2-Dichloropropane	1300	U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	50	
71-36-3	n-Butanol	11000	J	63000	2700	
78-93-3	2-Butanone (MEK)	2500	U	2500	130	
591-78-6	2-Hexanone	2500	U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	68	
67-64-1	Acetone	610	J	5000	250	
71-43-2	Benzene	1300	U	1300	53	
75-27-4	Bromodichloromethane	70	J	1300	50	
75-25-2	Bromoform	1300	U	1300	68	
74-83-9	Bromomethane	1300	U	1300	78	
75-15-0	Carbon Disulfide	2500	U	2500	50	
56-23-5	Carbon Tetrachloride	1300	U	1300	68	
108-90-7	Chlorobenzene	1300	U	1300	50	
75-00-3	Chloroethane	1300	U	1300	78	
67-66-3	Chloroform	370	J	1300	55	
74-87-3	Chloromethane	65	J	1300	60	
110-82-7	Cyclohexane	2500	U	2500	60	
124-48-1	Dibromochloromethane	1300	U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	
75-09-2	Dichloromethane	55	J	1300	55	
100-41-4	Ethylbenzene	1300	U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1103
Date Received: 8/ 3/11
Date Analyzed: 8/5/11 17:06

Sample Name: LC34-BW0002A-024.5-20110802
Lab Code: R1104287-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\080511\8433.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	50	
79-20-9	Methyl Acetate	2500	U	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	50	
108-87-2	Methylcyclohexane	2500	U	2500	63	
100-42-5	Styrene	1300	U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	50	
108-88-3	Toluene	1300	U	1300	50	
79-01-6	Trichloroethene (TCE)	300	J	1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	50	
75-01-4	Vinyl Chloride	820	J	1300	58	
156-59-2	cis-1,2-Dichloroethene	32000		1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	50	
179601-23-1	m,p-Xylenes	1300	U	1300	50	
123-86-4	n-Butyl Acetate	150	J	1300	53	
95-47-6	o-Xylene	1300	U	1300	50	
156-60-5	trans-1,2-Dichloroethene	610	J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 17:06	
Dibromofluoromethane	98	89-119	8/5/11 17:06	
Toluene-d8	97	87-121	8/5/11 17:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1103
Date Received: 8/ 3/11
Date Analyzed: 8/10/11 13:51

Sample Name: LC34-BW0002A-024.5-20110802
Lab Code: R1104287-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star828.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	32		1.0	
74-85-1	Ethene	18		1.0	
74-82-8	Methane	86		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1103
Date Received: 8/ 3/11
Date Analyzed: 8/22/11 17:25

Sample Name: LC34-BW0002A-024.5-20110802
Lab Code: R1104287-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082211\X0006197.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	13	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20110802
Lab Code: R1104287-002

Service Request: R1104287
Date Collected: 8/ 2/11 1024
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	8/5/11 18:43
Carbon, Total Organic (TOC), Average	9060A	12.9		mg/L	1.0	1	NA	8/10/11 19:00
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 13:45

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 2/11 1024
 Date Received: 8/ 3/11
 Date Analyzed: 8/5/11 17:34

Sample Name: LC34-BW0002B-031.5-20110802
 Lab Code: R1104287-002

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\L8434.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	J	1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	
106-93-4	1,2-Dibromoethane	1300	U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	50	
107-06-2	1,2-Dichloroethane	1300	U	1300	50	
78-87-5	1,2-Dichloropropane	1300	U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	50	
71-36-3	n-Butanol	63000	U	63000	2700	
78-93-3	2-Butanone (MEK)	2500	U	2500	130	
591-78-6	2-Hexanone	2500	U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	68	
67-64-1	Acetone	670	J	5000	250	
71-43-2	Benzene	1300	U	1300	53	
75-27-4	Bromodichloromethane	88	J	1300	50	
75-25-2	Bromoform	1300	U	1300	68	
74-83-9	Bromomethane	1300	U	1300	78	
75-15-0	Carbon Disulfide	2500	U	2500	50	
56-23-5	Carbon Tetrachloride	1300	U	1300	68	
108-90-7	Chlorobenzene	1300	U	1300	50	
75-00-3	Chloroethane	1300	U	1300	78	
67-66-3	Chloroform	340	J	1300	55	
74-87-3	Chloromethane	1300	U	1300	60	
110-82-7	Cyclohexane	2500	U	2500	60	
124-48-1	Dibromochloromethane	1300	U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	
75-09-2	Dichloromethane	1300	U	1300	55	
100-41-4	Ethylbenzene	1300	U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1024
Date Received: 8/ 3/11
Date Analyzed: 8/5/11 17:34

Sample Name: LC34-BW0002B-031.5-20110802
Lab Code: R1104287-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\8434.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	50	
79-20-9	Methyl Acetate	2500	U	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	50	
108-87-2	Methylcyclohexane	2500	U	2500	63	
100-42-5	Styrene	1300	U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	50	
108-88-3	Toluene	1300	U	1300	50	
79-01-6	Trichloroethene (TCE)	2500		1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	50	
75-01-4	Vinyl Chloride	470	J	1300	58	
156-59-2	cis-1,2-Dichloroethene	42000		1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	50	
179601-23-1	m,p-Xylenes	1300	U	1300	50	
123-86-4	n-Butyl Acetate	130	J	1300	53	
95-47-6	o-Xylene	1300	U	1300	50	
156-60-5	trans-1,2-Dichloroethene	580	J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 17:34	
Dibromofluoromethane	100	89-119	8/5/11 17:34	
Toluene-d8	98	87-121	8/5/11 17:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20110802
Lab Code: R1104287-002

Service Request: R1104287
Date Collected: 8/ 2/11 1024
Date Received: 8/ 3/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	82		1.0	1	NA	8/10/11 14:01		257189	
Ethene	14		1.0	1	NA	8/10/11 14:01		257189	
Methane	130	D	4.0	2	NA	8/10/11 14:16		257189	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1024
Date Received: 8/ 3/11
Date Analyzed: 8/22/11 22:05

Sample Name: LC34-BW0002B-031.5-20110802
Lab Code: R1104287-002

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082211\X0006203.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	48	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	3.7	2.0	
50-21-5	Lactic Acid	1.1	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Service Request: R1104287
Date Collected: 8/ 2/11 0937
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	480		mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	7.6		mg/L	1.0	10	NA	8/3/11 19:54	
Carbon, Total Organic (TOC), Average	9060A	354		mg/L	20	20	NA	8/13/11 12:41	
Chloride	300.0	539		mg/L	20	100	NA	8/4/11 08:47	
Iodide	300.0	12.9		mg/L	2.0	10	NA	8/16/11 13:54	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/3/11 19:54	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	8/4/11 08:47	
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	8/3/11 19:54	
Sulfide, Total	SM 4500-S2- F	10.5		mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0937
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 18:28

Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2690.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	
106-93-4	1,2-Dibromoethane	1300	U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	50	
107-06-2	1,2-Dichloroethane	1300	U	1300	50	
78-87-5	1,2-Dichloropropane	1300	U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	50	
71-36-3	n-Butanol	210000		63000	2700	
78-93-3	2-Butanone (MEK)	2500	U	2500	130	
591-78-6	2-Hexanone	2500	U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	68	
67-64-1	Acetone	540	J	5000	250	
71-43-2	Benzene	1300	U	1300	53	
75-27-4	Bromodichloromethane	1300	U	1300	50	
75-25-2	Bromoform	1300	U	1300	68	
74-83-9	Bromomethane	1300	U	1300	78	
75-15-0	Carbon Disulfide	2500	U	2500	50	
56-23-5	Carbon Tetrachloride	1300	U	1300	68	
108-90-7	Chlorobenzene	1300	U	1300	50	
75-00-3	Chloroethane	1300	U	1300	78	
67-66-3	Chloroform	260	J	1300	55	
74-87-3	Chloromethane	1300	U	1300	60	
110-82-7	Cyclohexane	2500	U	2500	60	
124-48-1	Dibromochloromethane	1300	U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	
75-09-2	Dichloromethane	65	J	1300	55	
100-41-4	Ethylbenzene	1300	U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0937
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 18:28

Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2690.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	50	
79-20-9	Methyl Acetate	73	J	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	50	
108-87-2	Methylcyclohexane	2500	U	2500	63	
100-42-5	Styrene	1300	U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	50	
108-88-3	Toluene	1300	U	1300	50	
79-01-6	Trichloroethene (TCE)	380	J	1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	50	
75-01-4	Vinyl Chloride	6100		1300	58	
156-59-2	cis-1,2-Dichloroethene	43000		1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	50	
179601-23-1	m,p-Xylenes	1300	U	1300	50	
123-86-4	n-Butyl Acetate	42000		1300	53	
95-47-6	o-Xylene	1300	U	1300	50	
156-60-5	trans-1,2-Dichloroethene	280	J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/9/11 18:28	
Dibromofluoromethane	103	89-119	8/9/11 18:28	
Toluene-d8	109	87-121	8/9/11 18:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0937
Date Received: 8/ 3/11
Date Analyzed: 8/10/11 14:26

Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star831.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	69		1.0	
74-85-1	Ethene	21		1.0	
74-82-8	Methane	52		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0937
Date Received: 8/ 3/11
Date Analyzed: 8/20/11 01:22

Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081911\X0006162.D\

Analysis Lot: 258188
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	350	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	290	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110802
Lab Code: R1104287-004

Service Request: R1104287
Date Collected: 8/ 2/11 1141
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.1	mg/L	1.0	10	NA	8/5/11 19:38	
Carbon, Total Organic (TOC), Average	9060A	4.1	mg/L	1.0	1	NA	8/10/11 19:40	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 14:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11 11:41
 Date Received: 8/3/11
 Date Analyzed: 8/5/11 18:31

Sample Name: LC34-BW0002D-045.5-20110802
 Lab Code: R1104287-004

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\080511\8436.D\

Analysis Lot: 256275
 Instrument Name: R-MS-08
 Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	13000	U	13000	530	
78-93-3	2-Butanone (MEK)	500	U	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	170	J	1000	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	20	J	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	250	U	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	12	J	250	11	
100-41-4	Ethylbenzene	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1141
Date Received: 8/ 3/11
Date Analyzed: 8/5/11 18:31

Sample Name: LC34-BW0002D-045.5-20110802
Lab Code: R1104287-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA8\DATA\080511\L8436.D\

Analysis Lot: 256275
Instrument Name: R-MS-08
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	43	J	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	1500		250	12	
156-59-2	cis-1,2-Dichloroethene	8800		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	86	J	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	59	J	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/5/11 18:31	
Dibromofluoromethane	101	89-119	8/5/11 18:31	
Toluene-d8	102	87-121	8/5/11 18:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20110802
Lab Code: R1104287-004

Service Request: R1104287
Date Collected: 8/ 2/11 1141
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	17		1.0	1	NA	8/10/11 14:38		257189	
Ethene	14		1.0	1	NA	8/10/11 14:38		257189	
Methane	290	D	10	5	NA	8/10/11 14:49		257189	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1141
Date Received: 8/ 3/11
Date Analyzed: 8/22/11 23:38

Sample Name: LC34-BW0002D-045.5-20110802
Lab Code: R1104287-004

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082211\X0006205.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	3.3		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20110802
Lab Code: R1104287-005

Service Request: R1104287
Date Collected: 8/ 2/11 1229
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.4		mg/L	1.0	10	NA	8/5/11 19:52	
Carbon, Total Organic (TOC), Average	9060A	4.4		mg/L	1.0	1	NA	8/10/11 20:20	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 14:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 2/11 1229
 Date Received: 8/ 3/11
 Date Analyzed: 8/8/11 17:10

Sample Name: LC34-BW0002E-052.5-20110802
 Lab Code: R1104287-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2649.D\

Analysis Lot: 256488
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	150 J	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	20 U	20	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.29 J	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1229
Date Received: 8/ 3/11
Date Analyzed: 8/8/11 17:10

Sample Name: LC34-BW0002E-052.5-20110802
Lab Code: R1104287-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2649.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	1.3	J	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	3.4	J	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	51		5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	43		5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	0.29	J	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/8/11 17:10	
Dibromofluoromethane	103	89-119	8/8/11 17:10	
Toluene-d8	104	87-121	8/8/11 17:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1229
Date Received: 8/ 3/11
Date Analyzed: 8/10/11 15:15

Sample Name: LC34-BW0002E-052.5-20110802
Lab Code: R1104287-005

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star834.run

Analysis Lot: 257189
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	8.4	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1229
Date Received: 8/ 3/11
Date Analyzed: 8/23/11 01:58

Sample Name: LC34-BW0002E-052.5-20110802
Lab Code: R1104287-005

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082211\X0006208.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	2.8	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20110802
Lab Code: R1104287-006

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.3	mg/L	1.0	10	NA	8/5/11 20:33	
Carbon, Total Organic (TOC), Average	9060A	7.1	mg/L	1.0	1	NA	8/10/11 21:00	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 16:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002F-059.5-20110802
 Lab Code: R1104287-006

Service Request: R1104287
 Date Collected: 8/2/11 1311
 Date Received: 8/3/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/5/11 19:27		256275	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/5/11 19:27		256275	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	8/5/11 19:27		256275	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,1-Dichloroethene (1,1-DCE)	0.43	J	5.0	0.29	1	NA	8/5/11 19:27		256275	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/5/11 19:27		256275	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/5/11 19:27		256275	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/5/11 19:27		256275	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
n-Butanol	250	U	250	11	1	NA	8/5/11 19:27		256275	
2-Butanone (MEK)	10	U	10	0.51	1	NA	8/5/11 19:27		256275	
2-Hexanone	10	U	10	0.35	1	NA	8/5/11 19:27		256275	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/5/11 19:27		256275	
Acetone	3.0	BJ	20	0.98	1	NA	8/5/11 19:27		256275	
Benzene	5.0	U	5.0	0.21	1	NA	8/5/11 19:27		256275	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Bromoform	5.0	U	5.0	0.27	1	NA	8/5/11 19:27		256275	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/5/11 19:27		256275	
Carbon Disulfide	2.1	J	10	0.20	1	NA	8/5/11 19:27		256275	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/5/11 19:27		256275	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/5/11 19:27		256275	
Chloroform	5.0	U	5.0	0.22	1	NA	8/5/11 19:27		256275	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/5/11 19:27		256275	
Cyclohexane	10	U	10	0.24	1	NA	8/5/11 19:27		256275	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/5/11 19:27		256275	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/5/11 19:27		256275	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Methyl Acetate	10	U	10	0.23	1	NA	8/5/11 19:27		256275	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20110802
Lab Code: R1104287-006

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Methylcyclohexane	10	U	10	0.25	1	NA	8/5/11 19:27		256275	
Styrene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Toluene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Trichloroethene (TCE)	5.1		5.0	0.23	1	NA	8/5/11 19:27		256275	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
Vinyl Chloride	440	D	25	1.2	5	NA	8/8/11 17:47		256488	
cis-1,2-Dichloroethene	150		5.0	0.20	1	NA	8/5/11 19:27		256275	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
n-Butyl Acetate	0.41	J	5.0	0.21	1	NA	8/5/11 19:27		256275	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	
trans-1,2-Dichloroethene	4.6	J	5.0	0.20	1	NA	8/5/11 19:27		256275	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 19:27		256275	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	8/5/11 19:27	
Dibromofluoromethane	102	89-119	8/5/11 19:27	
Toluene-d8	100	87-121	8/5/11 19:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11
Date Analyzed: 8/11/11 10:31

Sample Name: LC34-BW0002F-059.5-20110802
Lab Code: R1104287-006

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star840.run

Analysis Lot: 257194
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.3		1.0	
74-85-1	Ethene	1.5		1.0	
74-82-8	Methane	14		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11
Date Analyzed: 8/23/11 03:31

Sample Name: LC34-BW0002F-059.5-20110802
Lab Code: R1104287-006

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082211\X0006210.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	11	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20110802
Lab Code: R1104287-007

Service Request: R1104287
Date Collected: 8/ 2/11 1317
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	8/5/11 20:47	
Carbon, Total Organic (TOC), Average	9060A	7.2		mg/L	1.0	1	NA	8/10/11 21:40	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 14:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1317
Date Received: 8/ 3/11
Date Analyzed: 8/8/11 18:24

Sample Name: LC34-BW0003A-024.5-20110802
Lab Code: R1104287-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080811\J2651.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1300	U	1300	58	
79-34-5	1,1,2,2-Tetrachloroethane	1300	U	1300	50	
79-00-5	1,1,2-Trichloroethane	1300	U	1300	58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U	1300	78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	
120-82-1	1,2,4-Trichlorobenzene	1300	U	1300	65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	
106-93-4	1,2-Dibromoethane	1300	U	1300	50	
95-50-1	1,2-Dichlorobenzene	1300	U	1300	50	
107-06-2	1,2-Dichloroethane	1300	U	1300	50	
78-87-5	1,2-Dichloropropane	1300	U	1300	70	
541-73-1	1,3-Dichlorobenzene	1300	U	1300	50	
106-46-7	1,4-Dichlorobenzene	1300	U	1300	50	
71-36-3	n-Butanol	63000	U	63000	2700	
78-93-3	2-Butanone (MEK)	2500	U	2500	130	
591-78-6	2-Hexanone	2500	U	2500	88	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	68	
67-64-1	Acetone	260	J	5000	250	
71-43-2	Benzene	1300	U	1300	53	
75-27-4	Bromodichloromethane	1300	U	1300	50	
75-25-2	Bromoform	1300	U	1300	68	
74-83-9	Bromomethane	1300	U	1300	78	
75-15-0	Carbon Disulfide	2500	U	2500	50	
56-23-5	Carbon Tetrachloride	1300	U	1300	68	
108-90-7	Chlorobenzene	1300	U	1300	50	
75-00-3	Chloroethane	1300	U	1300	78	
67-66-3	Chloroform	210	J	1300	55	
74-87-3	Chloromethane	1300	U	1300	60	
110-82-7	Cyclohexane	2500	U	2500	60	
124-48-1	Dibromochloromethane	1300	U	1300	50	
75-71-8	Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	
75-09-2	Dichloromethane	1300	U	1300	55	
100-41-4	Ethylbenzene	1300	U	1300	50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 13:17
Date Received: 8/ 3/11
Date Analyzed: 8/8/11 18:24

Sample Name: LC34-BW0003A-024.5-20110802
Lab Code: R1104287-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2651.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 250

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1300	U	1300	50	
79-20-9	Methyl Acetate	2500	U	2500	58	
1634-04-4	Methyl tert-Butyl Ether	1300	U	1300	50	
108-87-2	Methylcyclohexane	2500	U	2500	63	
100-42-5	Styrene	1300	U	1300	50	
127-18-4	Tetrachloroethene (PCE)	1300	U	1300	50	
108-88-3	Toluene	1300	U	1300	50	
79-01-6	Trichloroethene (TCE)	1300	U	1300	58	
75-69-4	Trichlorofluoromethane (CFC 11)	1300	U	1300	50	
75-01-4	Vinyl Chloride	12000		1300	58	
156-59-2	cis-1,2-Dichloroethene	33000		1300	50	
10061-01-5	cis-1,3-Dichloropropene	1300	U	1300	50	
179601-23-1	m,p-Xylenes	1300	U	1300	50	
123-86-4	n-Butyl Acetate	1300	U	1300	53	
95-47-6	o-Xylene	1300	U	1300	50	
156-60-5	trans-1,2-Dichloroethene	760	J	1300	50	
10061-02-6	trans-1,3-Dichloropropene	1300	U	1300	50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	8/8/11 18:24	
Dibromofluoromethane	103	89-119	8/8/11 18:24	
Toluene-d8	108	87-121	8/8/11 18:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20110802
Lab Code: R1104287-007

Service Request: R1104287
Date Collected: 8/ 2/11 1317
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	12		1.0	1	NA	8/11/11 10:42		257194	
Ethene	240	D	5.0	5	NA	8/11/11 11:02		257194	
Methane	110	D	10	5	NA	8/11/11 11:02		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1317
Date Received: 8/ 3/11
Date Analyzed: 8/23/11 05:04

Sample Name: LC34-BW0003A-024.5-20110802
Lab Code: R1104287-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082211\X0006212.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	12	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20110802
Lab Code: R1104287-008

Service Request: R1104287
Date Collected: 8/ 2/11 1222
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	7.7	mg/L	1.0	10	NA	8/8/11 12:54	
Carbon, Total Organic (TOC), Average	9060A	89	mg/L	10	10	NA	8/10/11 22:20	
Iodide	300.0	9.6	mg/L	2.0	10	NA	8/16/11 14:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 2/11 1222
 Date Received: 8/ 3/11
 Date Analyzed: 8/8/11 19:01

Sample Name: LC34-BW0003B-031.5-20110802
 Lab Code: R1104287-008

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080811\J2652.D\

Analysis Lot: 256488
 Instrument Name: R-MS-07
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500 U	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	25000 U	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	2000 U	2000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	78 J	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1222
Date Received: 8/ 3/11
Date Analyzed: 8/8/11 19:01

Sample Name: LC34-BW0003B-031.5-20110802
Lab Code: R1104287-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080811\J2652.D\

Analysis Lot: 256488
Instrument Name: R-MS-07
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	500	U	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	14000		500	23	
156-59-2	cis-1,2-Dichloroethene	6700		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	88	J	500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	310	J	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	8/8/11 19:01	
Dibromofluoromethane	106	89-119	8/8/11 19:01	
Toluene-d8	111	87-121	8/8/11 19:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20110802
Lab Code: R1104287-008

Service Request: R1104287
Date Collected: 8/ 2/11 1222
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	24		1.0	1	NA	8/11/11 11:14		257194	
Ethene	410	D	5.0	5	NA	8/11/11 11:24		257194	
Methane	85		2.0	1	NA	8/11/11 11:14		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1222
Date Received: 8/ 3/11
Date Analyzed: 8/23/11 16:47

Sample Name: LC34-BW0003B-031.5-20110802
Lab Code: R1104287-008

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082311\X0006225.D\

Analysis Lot: 258678
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	120	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	95	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	2.1	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110802
Lab Code: R1104287-009

Service Request: R1104287
Date Collected: 8/ 2/11 1100
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	760		mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	52.0		mg/L	2.0	20	NA	8/11/11 21:36	
Carbon, Total Organic (TOC), Average	9060A	671		mg/L	50	50	NA	8/13/11 14:40	
Chloride	300.0	329		mg/L	16	80	NA	8/4/11 09:01	
Iodide	300.0	64.1		mg/L	4.0	20	NA	8/16/11 17:36	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/4/11 09:44	
Nitrite as Nitrogen	300.0	8.0	U	mg/L	8.0	80	NA	8/4/11 09:01	
Sulfate	300.0	3.4		mg/L	2.0	10	NA	8/3/11 20:37	
Sulfide, Total	SM 4500-S2- F	14.6		mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: LC34-BW0003C-038.5-20110802
 Lab Code: R1104287-009

Service Request: R1104287
 Date Collected: 8/ 2/11 1100
 Date Received: 8/ 3/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130	U	130	5.8	25	NA	8/9/11 20:19		256489	
1,1,2,2-Tetrachloroethane	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,1,2-Trichloroethane	130	U	130	5.8	25	NA	8/9/11 20:19		256489	
1,1,2-Trichloro-1,2,2-trifluoroethane	130	U	130	7.8	25	NA	8/9/11 20:19		256489	
1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	25	NA	8/9/11 20:19		256489	
1,2,4-Trichlorobenzene	130	U	130	6.5	25	NA	8/9/11 20:19		256489	
1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	25	NA	8/9/11 20:19		256489	
1,2-Dibromoethane	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,2-Dichlorobenzene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,2-Dichloroethane	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,2-Dichloropropane	130	U	130	7.1	25	NA	8/9/11 20:19		256489	
1,3-Dichlorobenzene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
1,4-Dichlorobenzene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
n-Butanol	190000	D	13000	530	50	NA	8/8/11 15:56		256488	
2-Butanone (MEK)	250	U	250	13	25	NA	8/9/11 20:19		256489	
2-Hexanone	250	U	250	8.8	25	NA	8/9/11 20:19		256489	
4-Methyl-2-pentanone	250	U	250	6.8	25	NA	8/9/11 20:19		256489	
Acetone	49	J	500	25	25	NA	8/9/11 20:19		256489	
Benzene	130	U	130	5.3	25	NA	8/9/11 20:19		256489	
Bromodichloromethane	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Bromoform	130	U	130	6.8	25	NA	8/9/11 20:19		256489	
Bromomethane	130	U	130	7.8	25	NA	8/9/11 20:19		256489	
Carbon Disulfide	250	U	250	5.0	25	NA	8/9/11 20:19		256489	
Carbon Tetrachloride	130	U	130	6.8	25	NA	8/9/11 20:19		256489	
Chlorobenzene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Chloroethane	130	U	130	7.8	25	NA	8/9/11 20:19		256489	
Chloroform	7.5	J	130	5.5	25	NA	8/9/11 20:19		256489	
Chloromethane	130	U	130	6.0	25	NA	8/9/11 20:19		256489	
Cyclohexane	250	U	250	6.0	25	NA	8/9/11 20:19		256489	
Dibromochloromethane	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Dichlorodifluoromethane (CFC 12)	130	U	130	15	25	NA	8/9/11 20:19		256489	
Dichloromethane	8.5	J	130	5.5	25	NA	8/9/11 20:19		256489	
Ethylbenzene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Isopropylbenzene (Cumene)	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Methyl Acetate	250	U	250	5.8	25	NA	8/9/11 20:19		256489	
Methyl tert-Butyl Ether	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Methylcyclohexane	250	U	250	6.3	25	NA	8/9/11 20:19		256489	
Styrene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Tetrachloroethene (PCE)	130	U	130	5.0	25	NA	8/9/11 20:19		256489	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110802
Lab Code: R1104287-009

Service Request: R1104287
Date Collected: 8/ 2/11 1100
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Toluene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Trichloroethene (TCE)	21	J	130	5.8	25	NA	8/9/11 20:19		256489	
Trichlorofluoromethane (CFC 11)	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
Vinyl Chloride	3100		130	5.8	25	NA	8/9/11 20:19		256489	
cis-1,2-Dichloroethene	2500		130	5.0	25	NA	8/9/11 20:19		256489	
cis-1,3-Dichloropropene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
m,p-Xylenes	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
n-Butyl Acetate	290		130	5.3	25	NA	8/9/11 20:19		256489	
o-Xylene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	
trans-1,2-Dichloroethene	67	J	130	5.0	25	NA	8/9/11 20:19		256489	
trans-1,3-Dichloropropene	130	U	130	5.0	25	NA	8/9/11 20:19		256489	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/9/11 20:19	
Dibromofluoromethane	106	89-119	8/9/11 20:19	
Toluene-d8	103	87-121	8/9/11 20:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110802
Lab Code: R1104287-009

Service Request: R1104287
Date Collected: 8/ 2/11 1100
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	15		1.0	1	NA	8/11/11 11:34		257194	
Ethene	150	D	10	10	NA	8/11/11 11:46		257194	
Methane	710	D	20	10	NA	8/11/11 11:46		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1100
Date Received: 8/ 3/11
Date Analyzed: 8/22/11 13:32

Sample Name: LC34-BW0003C-038.5-20110802
Lab Code: R1104287-009

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082211\X0006192.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	680	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	630	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	15	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20110802
Lab Code: R1104287-010

Service Request: R1104287
Date Collected: 8/ 2/11 1356
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	38.4	mg/L	1.0	10	NA	8/5/11 21:15	
Carbon, Total Organic (TOC), Average	9060A	603	mg/L	50	50	NA	8/13/11 16:39	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 15:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 2/11 1356
 Date Received: 8/ 3/11
 Date Analyzed: 8/9/11 15:24

Sample Name: LC34-BW0003D-045.5-20110802
 Lab Code: R1104287-010

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080911\J2685.D\

Analysis Lot: 256489
 Instrument Name: R-MS-07
 Dilution Factor: 1000

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000 U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000 U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000 U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	430 J	5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000 U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000 U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000 U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000 U	5000	380	
106-93-4	1,2-Dibromoethane	5000 U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000 U	5000	200	
107-06-2	1,2-Dichloroethane	5000 U	5000	200	
78-87-5	1,2-Dichloropropane	5000 U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000 U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000 U	5000	200	
71-36-3	n-Butanol	510000	250000	11000	
78-93-3	2-Butanone (MEK)	10000 U	10000	510	
591-78-6	2-Hexanone	10000 U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000 U	10000	270	
67-64-1	Acetone	1500 J	20000	980	
71-43-2	Benzene	5000 U	5000	210	
75-27-4	Bromodichloromethane	5000 U	5000	200	
75-25-2	Bromoform	5000 U	5000	270	
74-83-9	Bromomethane	5000 U	5000	310	
75-15-0	Carbon Disulfide	10000 U	10000	200	
56-23-5	Carbon Tetrachloride	5000 U	5000	270	
108-90-7	Chlorobenzene	5000 U	5000	200	
75-00-3	Chloroethane	5000 U	5000	310	
67-66-3	Chloroform	5000 U	5000	220	
74-87-3	Chloromethane	5000 U	5000	240	
110-82-7	Cyclohexane	10000 U	10000	240	
124-48-1	Dibromochloromethane	5000 U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000 U	5000	560	
75-09-2	Dichloromethane	280 J	5000	220	
100-41-4	Ethylbenzene	5000 U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1356
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 15:24

Sample Name: LC34-BW0003D-045.5-20110802
Lab Code: R1104287-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2685.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	
79-20-9	Methyl Acetate	240	J	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	1100	J	5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	740	J	5000	230	
156-59-2	cis-1,2-Dichloroethene	7500		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	170000		5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	8/9/11 15:24	
Dibromofluoromethane	103	89-119	8/9/11 15:24	
Toluene-d8	107	87-121	8/9/11 15:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1356
Date Received: 8/ 3/11
Date Analyzed: 8/11/11 12:00

Sample Name: LC34-BW0003D-045.5-20110802
Lab Code: R1104287-010

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star847.run

Analysis Lot: 257194
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	20	1.0	
74-85-1	Ethene	5.5	1.0	
74-82-8	Methane	18	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1356
Date Received: 8/ 3/11
Date Analyzed: 8/20/11 17:48

Sample Name: LC34-BW0003D-045.5-20110802
Lab Code: R1104287-010

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\081911\X0006178.D\

Analysis Lot: 258188
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	640	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	320	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20110802
Lab Code: R1104287-011

Service Request: R1104287
Date Collected: 8/ 2/11 1022
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	58.2	mg/L	2.0	20	NA	8/8/11 13:35	
Carbon, Total Organic (TOC), Average	9060A	905	mg/L	50	50	NA	8/13/11 17:19	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 15:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1022
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 16:01

Sample Name: LC34-BW0003E-052.5-20110802
Lab Code: R1104287-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2686.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 2500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13000	U	13000	580	
79-34-5	1,1,2,2-Tetrachloroethane	13000	U	13000	500	
79-00-5	1,1,2-Trichloroethane	13000	U	13000	580	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13000	U	13000	780	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13000	U	13000	500	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13000	U	13000	730	
120-82-1	1,2,4-Trichlorobenzene	13000	U	13000	650	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13000	U	13000	950	
106-93-4	1,2-Dibromoethane	13000	U	13000	500	
95-50-1	1,2-Dichlorobenzene	13000	U	13000	500	
107-06-2	1,2-Dichloroethane	13000	U	13000	500	
78-87-5	1,2-Dichloropropane	13000	U	13000	710	
541-73-1	1,3-Dichlorobenzene	13000	U	13000	500	
106-46-7	1,4-Dichlorobenzene	13000	U	13000	500	
71-36-3	n-Butanol	890000		630000	27000	
78-93-3	2-Butanone (MEK)	25000	U	25000	1300	
591-78-6	2-Hexanone	25000	U	25000	880	
108-10-1	4-Methyl-2-pentanone	25000	U	25000	680	
67-64-1	Acetone	5500	J	50000	2500	
71-43-2	Benzene	13000	U	13000	530	
75-27-4	Bromodichloromethane	13000	U	13000	500	
75-25-2	Bromoform	13000	U	13000	680	
74-83-9	Bromomethane	13000	U	13000	780	
75-15-0	Carbon Disulfide	25000	U	25000	500	
56-23-5	Carbon Tetrachloride	13000	U	13000	680	
108-90-7	Chlorobenzene	13000	U	13000	500	
75-00-3	Chloroethane	13000	U	13000	780	
67-66-3	Chloroform	1200	J	13000	550	
74-87-3	Chloromethane	13000	U	13000	600	
110-82-7	Cyclohexane	25000	U	25000	600	
124-48-1	Dibromochloromethane	13000	U	13000	500	
75-71-8	Dichlorodifluoromethane (CFC 12)	13000	U	13000	1500	
75-09-2	Dichloromethane	580	J	13000	550	
100-41-4	Ethylbenzene	13000	U	13000	500	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1022
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 16:01

Sample Name: LC34-BW0003E-052.5-20110802
Lab Code: R1104287-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2686.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 2500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13000	U	13000	500	
79-20-9	Methyl Acetate	1100	J	25000	580	
1634-04-4	Methyl tert-Butyl Ether	13000	U	13000	500	
108-87-2	Methylcyclohexane	25000	U	25000	630	
100-42-5	Styrene	13000	U	13000	500	
127-18-4	Tetrachloroethene (PCE)	13000	U	13000	500	
108-88-3	Toluene	13000	U	13000	500	
79-01-6	Trichloroethene (TCE)	13000	U	13000	580	
75-69-4	Trichlorofluoromethane (CFC 11)	13000	U	13000	500	
75-01-4	Vinyl Chloride	13000	U	13000	580	
156-59-2	cis-1,2-Dichloroethene	1700	J	13000	500	
10061-01-5	cis-1,3-Dichloropropene	13000	U	13000	500	
179601-23-1	m,p-Xylenes	13000	U	13000	500	
123-86-4	n-Butyl Acetate	420000		13000	530	
95-47-6	o-Xylene	13000	U	13000	500	
156-60-5	trans-1,2-Dichloroethene	13000	U	13000	500	
10061-02-6	trans-1,3-Dichloropropene	13000	U	13000	500	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/9/11 16:01	
Dibromofluoromethane	100	89-119	8/9/11 16:01	
Toluene-d8	106	87-121	8/9/11 16:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1022
Date Received: 8/ 3/11
Date Analyzed: 8/11/11 12:36

Sample Name: LC34-BW0003E-052.5-20110802
Lab Code: R1104287-011

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star849.run

Analysis Lot: 257194
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	3.3		1.0	
74-85-1	Ethene	1.7		1.0	
74-82-8	Methane	30		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1022
Date Received: 8/ 3/11
Date Analyzed: 8/22/11 15:05

Sample Name: LC34-BW0003E-052.5-20110802
Lab Code: R1104287-011

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082211\X0006194.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	870	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	360	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20110802
Lab Code: R1104287-012

Service Request: R1104287
Date Collected: 8/ 2/11 0943
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.5		mg/L	1.0	10	NA	8/5/11 22:10	
Carbon, Total Organic (TOC), Average	9060A	107		mg/L	10	10	NA	8/13/11 17:59	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 15:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 2/11 0943
 Date Received: 8/ 3/11
 Date Analyzed: 8/9/11 19:42

Sample Name: LC34-BW0003F-059.5-20110802
 Lab Code: R1104287-012

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2692.D\

Analysis Lot: 256489
 Instrument Name: R-MS-07
 Dilution Factor: 2.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13 U	13	0.58	
79-34-5	1,1,2,2-Tetrachloroethane	13 U	13	0.50	
79-00-5	1,1,2-Trichloroethane	13 U	13	0.58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13 U	13	0.78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13 U	13	0.50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13 U	13	0.73	
120-82-1	1,2,4-Trichlorobenzene	13 U	13	0.65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13 U	13	0.95	
106-93-4	1,2-Dibromoethane	13 U	13	0.50	
95-50-1	1,2-Dichlorobenzene	13 U	13	0.50	
107-06-2	1,2-Dichloroethane	13 U	13	0.50	
78-87-5	1,2-Dichloropropane	13 U	13	0.71	
541-73-1	1,3-Dichlorobenzene	13 U	13	0.50	
106-46-7	1,4-Dichlorobenzene	13 U	13	0.50	
71-36-3	n-Butanol	18000	630	27	
78-93-3	2-Butanone (MEK)	25 U	25	1.3	
591-78-6	2-Hexanone	25 U	25	0.88	
108-10-1	4-Methyl-2-pentanone	25 U	25	0.68	
67-64-1	Acetone	4.2 J	50	2.5	
71-43-2	Benzene	13 U	13	0.53	
75-27-4	Bromodichloromethane	13 U	13	0.50	
75-25-2	Bromoform	13 U	13	0.68	
74-83-9	Bromomethane	13 U	13	0.78	
75-15-0	Carbon Disulfide	25 U	25	0.50	
56-23-5	Carbon Tetrachloride	13 U	13	0.68	
108-90-7	Chlorobenzene	13 U	13	0.50	
75-00-3	Chloroethane	13 U	13	0.78	
67-66-3	Chloroform	13 U	13	0.55	
74-87-3	Chloromethane	13 U	13	0.60	
110-82-7	Cyclohexane	25 U	25	0.60	
124-48-1	Dibromochloromethane	13 U	13	0.50	
75-71-8	Dichlorodifluoromethane (CFC 12)	13 U	13	1.5	
75-09-2	Dichloromethane	0.55 J	13	0.55	
100-41-4	Ethylbenzene	13 U	13	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0943
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 19:42

Sample Name: LC34-BW0003F-059.5-20110802
Lab Code: R1104287-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2692.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13	U	13	0.50	
79-20-9	Methyl Acetate	25	U	25	0.58	
1634-04-4	Methyl tert-Butyl Ether	13	U	13	0.50	
108-87-2	Methylcyclohexane	25	U	25	0.63	
100-42-5	Styrene	13	U	13	0.50	
127-18-4	Tetrachloroethene (PCE)	13	U	13	0.50	
108-88-3	Toluene	13	U	13	0.50	
79-01-6	Trichloroethene (TCE)	2.7	J	13	0.58	
75-69-4	Trichlorofluoromethane (CFC 11)	13	U	13	0.50	
75-01-4	Vinyl Chloride	1.3	J	13	0.58	
156-59-2	cis-1,2-Dichloroethene	13	J	13	0.50	
10061-01-5	cis-1,3-Dichloropropene	13	U	13	0.50	
179601-23-1	m,p-Xylenes	13	U	13	0.50	
123-86-4	n-Butyl Acetate	93		13	0.53	
95-47-6	o-Xylene	13	U	13	0.50	
156-60-5	trans-1,2-Dichloroethene	13	U	13	0.50	
10061-02-6	trans-1,3-Dichloropropene	13	U	13	0.50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	8/9/11 19:42	
Dibromofluoromethane	101	89-119	8/9/11 19:42	
Toluene-d8	108	87-121	8/9/11 19:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20110802
Lab Code: R1104287-012

Service Request: R1104287
Date Collected: 8/ 2/11 0943
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	8/11/11 12:52		257194	
Ethene	1.0	U	1.0	1	NA	8/11/11 12:52		257194	
Methane	750	D	20	10	NA	8/11/11 13:07		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 0943
Date Received: 8/ 3/11
Date Analyzed: 8/23/11 18:50

Sample Name: LC34-BW0003F-059.5-20110802
Lab Code: R1104287-012

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082311\X0006227.D\

Analysis Lot: 258678
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	140	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	58	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	13	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11 11:41
 Date Received: 8/3/11
 Date Analyzed: 8/9/11 19:05

Sample Name: LC34-BW0002D-045.5-20110802-D
 Lab Code: R1104287-013

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2691.D\

Analysis Lot: 256489
 Instrument Name: R-MS-07
 Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	4300	J	13000	530	
78-93-3	2-Butanone (MEK)	500	U	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	98	J	1000	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	14	J	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	250	U	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	11	J	250	11	
100-41-4	Ethylbenzene	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1141
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 19:05

Sample Name: LC34-BW0002D-045.5-20110802-D
Lab Code: R1104287-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2691.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	41	J	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	1100		250	12	
156-59-2	cis-1,2-Dichloroethene	8100		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	81	J	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	63	J	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/9/11 19:05	
Dibromofluoromethane	102	89-119	8/9/11 19:05	
Toluene-d8	107	87-121	8/9/11 19:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20110802-D
Lab Code: R1104287-014

Service Request: R1104287
Date Collected: 8/ 2/11 1222
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	99	mg/L	10	10	NA	8/13/11 18:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20110802-D
Lab Code: R1104287-015

Service Request: R1104287
Date Collected: 8/ 2/11 1100
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfide, Total	SM 4500-S2- F	14.7	mg/L	1.0	1	NA	8/5/11 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 14:47

Sample Name: LC34-BW0002F-059.5-20110802-D
Lab Code: R1104287-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2684.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 2.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13 U	13	0.58	
79-34-5	1,1,2,2-Tetrachloroethane	13 U	13	0.50	
79-00-5	1,1,2-Trichloroethane	13 U	13	0.58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13 U	13	0.78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13 U	13	0.50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13 U	13	0.73	
120-82-1	1,2,4-Trichlorobenzene	13 U	13	0.65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13 U	13	0.95	
106-93-4	1,2-Dibromoethane	13 U	13	0.50	
95-50-1	1,2-Dichlorobenzene	13 U	13	0.50	
107-06-2	1,2-Dichloroethane	13 U	13	0.50	
78-87-5	1,2-Dichloropropane	13 U	13	0.71	
541-73-1	1,3-Dichlorobenzene	13 U	13	0.50	
106-46-7	1,4-Dichlorobenzene	13 U	13	0.50	
71-36-3	n-Butanol	630 U	630	27	
78-93-3	2-Butanone (MEK)	25 U	25	1.3	
591-78-6	2-Hexanone	25 U	25	0.88	
108-10-1	4-Methyl-2-pentanone	25 U	25	0.68	
67-64-1	Acetone	4.7 J	50	2.5	
71-43-2	Benzene	13 U	13	0.53	
75-27-4	Bromodichloromethane	0.55 J	13	0.50	
75-25-2	Bromoform	13 U	13	0.68	
74-83-9	Bromomethane	13 U	13	0.78	
75-15-0	Carbon Disulfide	0.53 J	25	0.50	
56-23-5	Carbon Tetrachloride	13 U	13	0.68	
108-90-7	Chlorobenzene	13 U	13	0.50	
75-00-3	Chloroethane	13 U	13	0.78	
67-66-3	Chloroform	2.2 J	13	0.55	
74-87-3	Chloromethane	13 U	13	0.60	
110-82-7	Cyclohexane	25 U	25	0.60	
124-48-1	Dibromochloromethane	13 U	13	0.50	
75-71-8	Dichlorodifluoromethane (CFC 12)	13 U	13	1.5	
75-09-2	Dichloromethane	13 U	13	0.55	
100-41-4	Ethylbenzene	13 U	13	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11 1311
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 14:47

Sample Name: LC34-BW0002F-059.5-20110802-D
Lab Code: R1104287-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2684.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13	U	13	0.50	
79-20-9	Methyl Acetate	25	U	25	0.58	
1634-04-4	Methyl tert-Butyl Ether	13	U	13	0.50	
108-87-2	Methylcyclohexane	25	U	25	0.63	
100-42-5	Styrene	13	U	13	0.50	
127-18-4	Tetrachloroethene (PCE)	13	U	13	0.50	
108-88-3	Toluene	13	U	13	0.50	
79-01-6	Trichloroethene (TCE)	2.1	J	13	0.58	
75-69-4	Trichlorofluoromethane (CFC 11)	13	U	13	0.50	
75-01-4	Vinyl Chloride	370		13	0.58	
156-59-2	cis-1,2-Dichloroethene	100		13	0.50	
10061-01-5	cis-1,3-Dichloropropene	13	U	13	0.50	
179601-23-1	m,p-Xylenes	13	U	13	0.50	
123-86-4	n-Butyl Acetate	13	U	13	0.53	
95-47-6	o-Xylene	13	U	13	0.50	
156-60-5	trans-1,2-Dichloroethene	2.7	J	13	0.50	
10061-02-6	trans-1,3-Dichloropropene	13	U	13	0.50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	8/9/11 14:47	
Dibromofluoromethane	104	89-119	8/9/11 14:47	
Toluene-d8	106	87-121	8/9/11 14:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11
Date Analyzed: 8/20/11 23:58

Sample Name: LC34-FD-20110802-08
Lab Code: R1104287-017

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\081911\X0006184.D\

Analysis Lot: 258188
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	620	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	310	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-05
Lab Code: R1104287-018

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	8/5/11 22:24	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 15:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-06
Lab Code: R1104287-019

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	mg/L	1.0	10	NA	8/5/11 22:37	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	8/16/11 16:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-03
Lab Code: R1104287-020

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	13.8		mg/L	1.0	1	NA	8/13/11 19:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-07
Lab Code: R1104287-021

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	12		1.0	1	NA	8/11/11 13:18		257194	
Ethene	250	D	5.0	5	NA	8/11/11 13:35		257194	
Methane	110	D	10	5	NA	8/11/11 13:35		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-02
Lab Code: R1104287-022

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	8/11/11 13:46		257194	
Ethene	1.0	U	1.0	1	NA	8/11/11 13:46		257194	
Methane	850	D	20	10	NA	8/11/11 14:04		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-01
Lab Code: R1104287-023

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	53.2	mg/L	2.0	10	NA	8/4/11 09:15	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/4/11 08:31	
Nitrite as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/4/11 09:15	
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/3/11 20:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-FD-20110802-04
Lab Code: R1104287-024

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	746		mg/L	2.0	1	NA	8/16/11 09:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 14:10

Sample Name: LC34-TB-20110802
Lab Code: R1104287-025

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2683.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 2/11
Date Received: 8/ 3/11
Date Analyzed: 8/9/11 14:10

Sample Name: LC34-TB-20110802
Lab Code: R1104287-025

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2683.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/9/11 14:10	
Dibromofluoromethane	102	89-119	8/9/11 14:10	
Toluene-d8	106	87-121	8/9/11 14:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 3/11 1552
 Date Received: 8/ 5/11
 Date Analyzed: 8/9/11 16:38

Sample Name: LC34-IDW183866-20110803
 Lab Code: R1104287-026

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2687.D\

Analysis Lot: 256489
 Instrument Name: R-MS-07
 Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	380		250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	38000		13000	530	
78-93-3	2-Butanone (MEK)	430	J	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	110	J	1000	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	13	J	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	500	U	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	58	J	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	11	J	250	11	
100-41-4	Ethylbenzene	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 3/11 1552
Date Received: 8/ 5/11
Date Analyzed: 8/9/11 16:38

Sample Name: LC34-IDW183866-20110803
Lab Code: R1104287-026

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2687.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	
79-20-9	Methyl Acetate	13	J	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	120	J	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	980		250	12	
156-59-2	cis-1,2-Dichloroethene	5100		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	8100		250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	68	J	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	8/9/11 16:38	
Dibromofluoromethane	105	89-119	8/9/11 16:38	
Toluene-d8	108	87-121	8/9/11 16:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: LC34-IDW183865-20110803
 Lab Code: R1104287-027

Service Request: R1104287
 Date Collected: 8/ 3/11 1600
 Date Received: 8/ 5/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	8/9/11 17:51		256489	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,1,2-Trichloroethane	500	U	500	23	100	NA	8/9/11 17:51		256489	
1,1,2-Trichloro-1,2,2-trifluoroethane	3700		500	31	100	NA	8/9/11 17:51		256489	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	8/9/11 17:51		256489	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	8/9/11 17:51		256489	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	8/9/11 17:51		256489	
1,2-Dibromoethane	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,2-Dichlorobenzene	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,2-Dichloroethane	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,2-Dichloropropane	500	U	500	29	100	NA	8/9/11 17:51		256489	
1,3-Dichlorobenzene	500	U	500	20	100	NA	8/9/11 17:51		256489	
1,4-Dichlorobenzene	500	U	500	20	100	NA	8/9/11 17:51		256489	
n-Butanol	150000		25000	1100	100	NA	8/9/11 17:51		256489	
2-Butanone (MEK)	1000	U	1000	51	100	NA	8/9/11 17:51		256489	
2-Hexanone	1000	U	1000	35	100	NA	8/9/11 17:51		256489	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	8/9/11 17:51		256489	
Acetone	340	J	2000	98	100	NA	8/9/11 17:51		256489	
Benzene	500	U	500	21	100	NA	8/9/11 17:51		256489	
Bromodichloromethane	500	U	500	20	100	NA	8/9/11 17:51		256489	
Bromoform	500	U	500	27	100	NA	8/9/11 17:51		256489	
Bromomethane	500	U	500	31	100	NA	8/9/11 17:51		256489	
Carbon Disulfide	1000	U	1000	20	100	NA	8/9/11 17:51		256489	
Carbon Tetrachloride	500	U	500	27	100	NA	8/9/11 17:51		256489	
Chlorobenzene	500	U	500	20	100	NA	8/9/11 17:51		256489	
Chloroethane	500	U	500	31	100	NA	8/9/11 17:51		256489	
Chloroform	61	J	500	22	100	NA	8/9/11 17:51		256489	
Chloromethane	500	U	500	24	100	NA	8/9/11 17:51		256489	
Cyclohexane	1000	U	1000	24	100	NA	8/9/11 17:51		256489	
Dibromochloromethane	500	U	500	20	100	NA	8/9/11 17:51		256489	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	8/9/11 17:51		256489	
Dichloromethane	24	J	500	22	100	NA	8/9/11 17:51		256489	
Ethylbenzene	500	U	500	20	100	NA	8/9/11 17:51		256489	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	8/9/11 17:51		256489	
Methyl Acetate	41	J	1000	23	100	NA	8/9/11 17:51		256489	
Methyl tert-Butyl Ether	500	U	500	20	100	NA	8/9/11 17:51		256489	
Methylcyclohexane	1000	U	1000	25	100	NA	8/9/11 17:51		256489	
Styrene	500	U	500	20	100	NA	8/9/11 17:51		256489	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	8/9/11 17:51		256489	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: LC34-IDW183865-20110803
Lab Code: R1104287-027

Service Request: R1104287
Date Collected: 8/ 3/11 1600
Date Received: 8/ 5/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Toluene	500	U	500	20	100	NA	8/9/11 17:51		256489	
Trichloroethene (TCE)	4000		500	23	100	NA	8/9/11 17:51		256489	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	8/9/11 17:51		256489	
Vinyl Chloride	300	J	500	23	100	NA	8/9/11 17:51		256489	
cis-1,2-Dichloroethene	4600		500	20	100	NA	8/9/11 17:51		256489	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	8/9/11 17:51		256489	
m,p-Xylenes	500	U	500	20	100	NA	8/9/11 17:51		256489	
n-Butyl Acetate	40000	D	1000	42	200	NA	8/9/11 21:33		256489	
o-Xylene	500	U	500	20	100	NA	8/9/11 17:51		256489	
trans-1,2-Dichloroethene	39	J	500	20	100	NA	8/9/11 17:51		256489	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	8/9/11 17:51		256489	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/9/11 17:51	
Dibromofluoromethane	104	89-119	8/9/11 17:51	
Toluene-d8	106	87-121	8/9/11 17:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/ 3/11
 Date Received: 8/ 5/11
 Date Analyzed: 8/9/11 17:15

Sample Name: LC34-TB-20110803
 Lab Code: R1104287-028

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQU\DATA\MSVOA7\DATA\080911\J2688.D\

Analysis Lot: 256489
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	87	J	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/ 3/11
Date Received: 8/ 5/11
Date Analyzed: 8/9/11 17:15

Sample Name: LC34-TB-20110803
Lab Code: R1104287-028

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\080911\J2688.D\

Analysis Lot: 256489
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	0.48	J	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	8/9/11 17:15	
Dibromofluoromethane	105	89-119	8/9/11 17:15	
Toluene-d8	108	87-121	8/9/11 17:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104287-MB1

Service Request: R1104287
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/3/11 18:57	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/10/11 17:01	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/4/11 07:28	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 11:01	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/3/11 18:57	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/4/11 07:28	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/3/11 18:57	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	8/5/11 11:00	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104287-MB2

Service Request: R1104287
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/5/11 13:12	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/13/11 06:03	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 14:37	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/4/11 07:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104287-MB3

Service Request: R1104287
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	8/5/11 19:10	
Nitrate as Nitrogen	300.0	0.10 U	mg/L	0.10	1	NA	8/4/11 07:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104287-MB4

Service Request: R1104287
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	8/8/11 08:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104287-MB5

Service Request: R1104287
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	8/11/11 20:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1107489-03

Service Request: R1104287
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/5/11 13:34		256275	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/5/11 13:34		256275	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	8/5/11 13:34		256275	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	8/5/11 13:34		256275	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/5/11 13:34		256275	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/5/11 13:34		256275	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/5/11 13:34		256275	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
n-Butanol	250	U	250	11	1	NA	8/5/11 13:34		256275	
2-Butanone (MEK)	10	U	10	0.51	1	NA	8/5/11 13:34		256275	
2-Hexanone	10	U	10	0.35	1	NA	8/5/11 13:34		256275	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/5/11 13:34		256275	
Acetone	3.2	J	20	0.98	1	NA	8/5/11 13:34		256275	
Benzene	5.0	U	5.0	0.21	1	NA	8/5/11 13:34		256275	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Bromoform	5.0	U	5.0	0.27	1	NA	8/5/11 13:34		256275	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/5/11 13:34		256275	
Carbon Disulfide	10	U	10	0.20	1	NA	8/5/11 13:34		256275	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/5/11 13:34		256275	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/5/11 13:34		256275	
Chloroform	5.0	U	5.0	0.22	1	NA	8/5/11 13:34		256275	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/5/11 13:34		256275	
Cyclohexane	10	U	10	0.24	1	NA	8/5/11 13:34		256275	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/5/11 13:34		256275	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/5/11 13:34		256275	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Methyl Acetate	10	U	10	0.23	1	NA	8/5/11 13:34		256275	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107489-03

Service Request: R1104287
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Methylcyclohexane	10	U	10	0.25	1	NA	8/5/11 13:34		256275	
Styrene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Toluene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	8/5/11 13:34		256275	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	8/5/11 13:34		256275	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	8/5/11 13:34		256275	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/5/11 13:34		256275	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/5/11 13:34	
Dibromofluoromethane	103	89-119	8/5/11 13:34	
Toluene-d8	99	87-121	8/5/11 13:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1107573-04

Service Request: R1104287
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/8/11 14:05		256488	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/8/11 14:05		256488	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	8/8/11 14:05		256488	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	8/8/11 14:05		256488	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/8/11 14:05		256488	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/8/11 14:05		256488	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/8/11 14:05		256488	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
n-Butanol	250	U	250	11	1	NA	8/8/11 14:05		256488	
2-Butanone (MEK)	10	U	10	0.51	1	NA	8/8/11 14:05		256488	
2-Hexanone	10	U	10	0.35	1	NA	8/8/11 14:05		256488	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/8/11 14:05		256488	
Acetone	20	U	20	0.98	1	NA	8/8/11 14:05		256488	
Benzene	5.0	U	5.0	0.21	1	NA	8/8/11 14:05		256488	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Bromoform	5.0	U	5.0	0.27	1	NA	8/8/11 14:05		256488	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/8/11 14:05		256488	
Carbon Disulfide	10	U	10	0.20	1	NA	8/8/11 14:05		256488	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/8/11 14:05		256488	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/8/11 14:05		256488	
Chloroform	5.0	U	5.0	0.22	1	NA	8/8/11 14:05		256488	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/8/11 14:05		256488	
Cyclohexane	10	U	10	0.24	1	NA	8/8/11 14:05		256488	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/8/11 14:05		256488	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/8/11 14:05		256488	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Methyl Acetate	10	U	10	0.23	1	NA	8/8/11 14:05		256488	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107573-04

Service Request: R1104287
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Methylcyclohexane	10	U	10	0.25	1	NA	8/8/11 14:05		256488	
Styrene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Toluene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	8/8/11 14:05		256488	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	8/8/11 14:05		256488	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	8/8/11 14:05		256488	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/8/11 14:05		256488	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/8/11 14:05	
Dibromofluoromethane	103	89-119	8/8/11 14:05	
Toluene-d8	106	87-121	8/8/11 14:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1107575-04

Service Request: R1104287
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/9/11 13:32		256489	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/9/11 13:32		256489	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	8/9/11 13:32		256489	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	8/9/11 13:32		256489	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	8/9/11 13:32		256489	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	8/9/11 13:32		256489	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	8/9/11 13:32		256489	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
n-Butanol	250	U	250	11	1	NA	8/9/11 13:32		256489	
2-Butanone (MEK)	10	U	10	0.51	1	NA	8/9/11 13:32		256489	
2-Hexanone	10	U	10	0.35	1	NA	8/9/11 13:32		256489	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	8/9/11 13:32		256489	
Acetone	20	U	20	0.98	1	NA	8/9/11 13:32		256489	
Benzene	5.0	U	5.0	0.21	1	NA	8/9/11 13:32		256489	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Bromoform	5.0	U	5.0	0.27	1	NA	8/9/11 13:32		256489	
Bromomethane	5.0	U	5.0	0.31	1	NA	8/9/11 13:32		256489	
Carbon Disulfide	10	U	10	0.20	1	NA	8/9/11 13:32		256489	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	8/9/11 13:32		256489	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Chloroethane	5.0	U	5.0	0.31	1	NA	8/9/11 13:32		256489	
Chloroform	5.0	U	5.0	0.22	1	NA	8/9/11 13:32		256489	
Chloromethane	5.0	U	5.0	0.24	1	NA	8/9/11 13:32		256489	
Cyclohexane	10	U	10	0.24	1	NA	8/9/11 13:32		256489	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	8/9/11 13:32		256489	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/9/11 13:32		256489	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Methyl Acetate	10	U	10	0.23	1	NA	8/9/11 13:32		256489	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107575-04

Service Request: R1104287
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Methylcyclohexane	10	U	10	0.25	1	NA	8/9/11 13:32		256489	
Styrene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Toluene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	8/9/11 13:32		256489	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	8/9/11 13:32		256489	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	8/9/11 13:32		256489	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/9/11 13:32		256489	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	8/9/11 13:32	
Dibromofluoromethane	103	89-119	8/9/11 13:32	
Toluene-d8	106	87-121	8/9/11 13:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: NA
Date Received: NA
Date Analyzed: 8/16/11 13:37

Sample Name: Method Blank
Lab Code: RQ1108014-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\081611\D4124.D\

Analysis Lot: 257676
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: NA
Date Received: NA
Date Analyzed: 8/16/11 13:37

Sample Name: Method Blank
Lab Code: RQ1108014-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\081611\04124.D\

Analysis Lot: 257676
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	8/16/11 13:37	
Dibromofluoromethane	98	89-119	8/16/11 13:37	
Toluene-d8	101	87-121	8/16/11 13:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107801-01

Service Request: R1104287
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	8/10/11 10:10		257189	
Ethene	1.0	U	1.0	1	NA	8/10/11 10:10		257189	
Methane	2.0	U	2.0	1	NA	8/10/11 10:10		257189	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107803-01

Service Request: R1104287
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	8/11/11 09:06		257194	
Ethene	1.0	U	1.0	1	NA	8/11/11 09:06		257194	
Methane	2.0	U	2.0	1	NA	8/11/11 09:06		257194	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: NA
Date Received: NA
Date Analyzed: 8/19/11 13:48

Sample Name: Method Blank
Lab Code: RQ1108119-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\081911\X0006150.D\

Analysis Lot: 258188
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: NA
Date Received: NA
Date Analyzed: 8/22/11 11:12

Sample Name: Method Blank
Lab Code: RQ1108162-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082211\X0006189.D\

Analysis Lot: 258360
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: NA
Date Received: NA
Date Analyzed: 8/23/11 13:53

Sample Name: Method Blank
Lab Code: RQ1108248-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082311\X0006222.D\

Analysis Lot: 258678
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/2/11
Date Received: 8/3/11
Date Analyzed: 8/ 3/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0002C-038.5-20110802
Lab Code: R1104287-003

Units: mg/L
Basis: NA

LC34-BW0002C-038.
 5-20110802DUP

Duplicate Sample
 R1104287-003DUP1

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Bromide	300.0	1.0	7.6	8.6	8.07	13	20
Sulfate	300.0	2.0	2.0 U	2.0 U	NC	NC	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11
 Date Received: 8/3/11
 Date Analyzed: 8/3/11

Matrix Spike Summary
 General Chemistry Parameters

Sample Name: LC34-BW0002C-038.5-20110802
 Lab Code: R1104287-003

Units: mg/L
 Basis: NA

Analytical Method: 300.0

LC34-BW0002C-038.5-201108
 02MS
 Matrix Spike
 R1104287-003MS1

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	7.6	16.3	10.0	88 *	90 - 110
Sulfate	ND	21.4	20.0	107	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11
 Date Received: 8/3/11
 Date Analyzed: 8/ 8/11 -
 8/10/11

Replicate Sample Summary
 General Chemistry Parameters

Sample Name: LC34-BW0003B-031.5-20110802
 Lab Code: R1104287-008

Units: mg/L
 Basis: NA

LC34-BW0003B-031.
 5-20110802DUP

Duplicate Sample
 R1104287-008DUP3

Analyte Name	Method	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit
Bromide	300.0	1.0	7.7	7.8	7.75	1	20
Carbon, Total Organic (TOC), Average	9060A	10	89	89	88.9	<1	20

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Collected: 8/2/11
Date Received: 8/3/11
Date Analyzed: 8/ 8/11 -
 8/10/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0003B-031.5-20110802
Lab Code: R1104287-008

Units: mg/L
Basis: NA

LC34-BW0003B-031.5-2
 0110802MS
Matrix Spike
 R1104287-008MS3

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	300.0	7.7	17.3	10.0	96	90 - 110
Carbon, Total Organic (TOC), Average	9060A	89	186	100	97	62 - 135

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11
 Date Received: 8/3/11
 Date Analyzed: 8/16/11

Replicate Sample Summary
 General Chemistry Parameters

Sample Name: LC34-BW0003D-045.5-20110802
 Lab Code: R1104287-010

Units: mg/L
 Basis: NA

LC34-BW0003D-045
 .5-20110802DUP
 Duplicate Sample
 R1104287-010DUP5

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Iodide	300.0	2.0	2.0 U	2.0 U	NC	NC	20

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11
 Date Received: 8/3/11
 Date Analyzed: 8/16/11

Matrix Spike Summary
 General Chemistry Parameters

Sample Name: LC34-BW0003D-045.5-20110802
 Lab Code: R1104287-010

Units: mg/L
 Basis: NA

Analytical Method: 300.0

LC34-BW0003D-045.5-201108

02MS

Matrix Spike

R1104287-010MS5

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Iodide	ND	12.8	10.0	128 *	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Collected: 8/2/11
 Date Received: 8/3/11
 Date Analyzed: 8/22/11

Matrix Spike Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-BW0002A-024.5-20110802
 Lab Code: R1104287-001

Units: mg/L
 Basis: NA

Analytical Method: Organic Acids

Analyte Name	Sample Result	LC34-BW0002A-024.5-201108 02MS Matrix Spike RQ1108162-04			LC34-BW0002A-024.5-201108 02DMS Duplicate Matrix Spike RQ1108162-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	0.950	1.00	95	0.940	1.00	94	25 - 152	1	30
Acetic Acid	13	21.4	10.0	79	21.4	10.0	79	13 - 167	<1	30
Butanoic Acid (Butyric Acid)	ND	11.2	10.0	112	10.7	10.0	107	49 - 145	5	30
Lactic Acid	ND	9.48	9.97	95	9.58	9.97	96	27 - 127	1	30
Propionic Acid	ND	9.31	9.97	93	9.11	9.97	91	68 - 133	2	30

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104287-LCS1			Duplicate Lab Control Sample R1104287-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.65	5.2	108	5.49	5.2	105	56 - 138	3	20

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 3/11 -
 8/16/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104287-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.06	1.00	106	90 - 110
Chloride	300.0	1.99	2.00	100	90 - 110
Iodide	300.0	1.04	1.00	104	90 - 110
Nitrate as Nitrogen	300.0	1.07	1.00	107	90 - 110
Sulfate	300.0	1.91	2.00	96	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.9	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117
Nitrite as Nitrogen	300.0	1.01	1.00	101	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 4/11 -
 8/16/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104287-LCS3			
		Result	Spike Amount	% Rec	% Rec Limits
Bromide	300.0	1.06	1.00	106	90 - 110
Iodide	300.0	1.02	1.00	102	90 - 110
Nitrate as Nitrogen	300.0	1.07	1.00	107	90 - 110
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 4/11 -
8/ 5/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104287-LCS4			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 8/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104287-LCS5			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.05	1.00	105	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/11/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample		% Rec	% Rec Limits
		Result	Spike Amount		
Bromide	300.0	1.08	1.00	108	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 5/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256275

Analyte Name	Lab Control Sample RQ1107489-04			Duplicate Lab Control Sample RQ1107489-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	19.7	20.0	99	17.8	20.0	89	72 - 128	10	30
1,1,2,2-Tetrachloroethane	20.7	20.0	103	20.5	20.0	103	72 - 131	<1	30
1,1,2-Trichloroethane	21.3	20.0	106	21.3	20.0	107	80 - 122	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	18.0	20.0	90	16.4	20.0	82	68 - 136	9	30
1,1-Dichloroethane (1,1-DCA)	21.7	20.0	109	20.9	20.0	105	76 - 124	4	30
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	93	18.1	20.0	91	72 - 129	3	30
1,2,4-Trichlorobenzene	19.1	20.0	96	18.8	20.0	94	70 - 133	2	30
1,2-Dibromo-3-chloropropane (DBCP)	17.5	20.0	88	19.3	20.0	97	62 - 131	10	30
1,2-Dibromoethane	20.1	20.0	100	20.2	20.0	101	78 - 125	<1	30
1,2-Dichlorobenzene	19.5	20.0	98	19.6	20.0	98	79 - 124	<1	30
1,2-Dichloroethane	20.6	20.0	103	19.7	20.0	99	73 - 127	4	30
1,2-Dichloropropane	23.6	20.0	118	23.1	20.0	115	80 - 123	2	30
1,3-Dichlorobenzene	19.0	20.0	95	18.9	20.0	94	78 - 124	<1	30
1,4-Dichlorobenzene	19.6	20.0	98	19.2	20.0	96	78 - 123	2	30
n-Butanol	1140	1000	114	1210	1000	121	70 - 130	6	30
2-Butanone (MEK)	20.3	20.0	102	21.4	20.0	107	60 - 133	5	30
2-Hexanone	19.2	20.0	96	19.6	20.0	98	61 - 131	2	30
4-Methyl-2-pentanone	18.9	20.0	95	19.6	20.0	98	61 - 132	4	30
Acetone	20.2	20.0	101	20.3	20.0	102	54 - 139	<1	30
Benzene	21.9	20.0	109	20.7	20.0	104	78 - 121	5	30
Bromodichloromethane	20.4	20.0	102	19.9	20.0	100	80 - 125	2	30
Bromoform	18.0	20.0	90	17.7	20.0	88	68 - 130	2	30
Bromomethane	16.4	20.0	82	15.2	20.0	76	57 - 144	8	30
Carbon Disulfide	19.9	20.0	99	19.4	20.0	97	52 - 140	3	30
Carbon Tetrachloride	18.9	20.0	95	17.0	20.0	85	68 - 133	10	30
Chlorobenzene	20.3	20.0	102	20.1	20.0	100	80 - 121	1	30
Chloroethane	23.4	20.0	117	21.8	20.0	109	71 - 130	7	30
Chloroform	20.7	20.0	103	19.9	20.0	100	78 - 125	4	30
Chloromethane	21.3	20.0	107	19.9	20.0	99	61 - 138	7	30
Cyclohexane	20.4	20.0	102	24.3	20.0	121	57 - 126	17	30
Dibromochloromethane	18.9	20.0	95	18.6	20.0	93	78 - 133	2	30
Dichlorodifluoromethane (CFC 12)	18.8	20.0	94	17.9	20.0	89	45 - 159	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 5/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256275

Analyte Name	Lab Control Sample RQ1107489-04			Duplicate Lab Control Sample RQ1107489-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	20.3	20.0	102	19.1	20.0	96	75 - 125	6	30
Ethylbenzene	21.0	20.0	105	19.6	20.0	98	78 - 123	7	30
Isopropylbenzene (Cumene)	21.7	20.0	109	20.6	20.0	103	73 - 133	5	30
Methyl Acetate	19.5	20.0	98	19.9	20.0	99	57 - 157	2	30
Methyl tert-Butyl Ether	20.3	20.0	101	20.0	20.0	100	75 - 126	1	30
Methylcyclohexane	18.8	20.0	94	22.0	20.0	110	61 - 125	16	30
Styrene	20.4	20.0	102	20.2	20.0	101	80 - 132	1	30
Tetrachloroethene (PCE)	19.3	20.0	97	18.2	20.0	91	72 - 131	6	30
Toluene	21.0	20.0	105	19.6	20.0	98	78 - 122	7	30
Trichloroethene (TCE)	20.8	20.0	104	19.1	20.0	96	74 - 127	8	30
Trichlorofluoromethane (CFC 11)	20.2	20.0	101	19.2	20.0	96	69 - 141	5	30
Vinyl Chloride	25.6	20.0	128	23.2	20.0	116	72 - 138	10	30
cis-1,2-Dichloroethene	21.1	20.0	105	20.2	20.0	101	78 - 122	4	30
cis-1,3-Dichloropropene	20.0	20.0	100	19.7	20.0	98	77 - 125	2	30
m,p-Xylenes	41.6	40.0	104	39.8	40.0	99	79 - 126	4	30
n-Butyl Acetate	18.3	20.0	92	19.6	20.0	98	31 - 144	7	30
o-Xylene	20.7	20.0	103	20.2	20.0	101	77 - 118	2	30
trans-1,2-Dichloroethene	20.5	20.0	102	18.9	20.0	95	75 - 121	8	30
trans-1,3-Dichloropropene	19.0	20.0	95	18.5	20.0	93	69 - 127	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Analyzed: 8/ 8/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 256488

Lab Control Sample
 RQ1107573-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.5	20.0	87	72 - 128
1,1,2,2-Tetrachloroethane	16.4	20.0	82	72 - 131
1,1,2-Trichloroethane	17.3	20.0	87	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.6	20.0	93	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.3	20.0	96	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.7	20.0	94	72 - 129
1,2,4-Trichlorobenzene	22.7	20.0	113	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	17.3	20.0	87	78 - 125
1,2-Dichlorobenzene	18.5	20.0	92	79 - 124
1,2-Dichloroethane	17.3	20.0	86	73 - 127
1,2-Dichloropropane	17.7	20.0	89	80 - 123
1,3-Dichlorobenzene	19.4	20.0	97	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
n-Butanol	1230	1000	123	70 - 130
2-Butanone (MEK)	15.8	20.0	79	60 - 133
2-Hexanone	15.2	20.0	76	61 - 131
4-Methyl-2-pentanone	15.9	20.0	79	61 - 132
Acetone	17.2	20.0	86	54 - 139
Benzene	17.6	20.0	88	78 - 121
Bromodichloromethane	17.0	20.0	85	80 - 125
Bromoform	16.8	20.0	84	68 - 130
Bromomethane	17.1	20.0	85	57 - 144
Carbon Disulfide	19.2	20.0	96	52 - 140
Carbon Tetrachloride	18.0	20.0	90	68 - 133
Chlorobenzene	18.0	20.0	90	80 - 121
Chloroethane	20.1	20.0	101	71 - 130
Chloroform	17.9	20.0	90	78 - 125
Chloromethane	19.7	20.0	99	61 - 138
Cyclohexane	21.3	20.0	106	57 - 126
Dibromochloromethane	18.1	20.0	91	78 - 133
Dichlorodifluoromethane (CFC 12)	22.6	20.0	113	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 8/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 256488

**Lab Control Sample
 RQ1107573-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.9	20.0	89	75 - 125
Ethylbenzene	18.7	20.0	93	78 - 123
Isopropylbenzene (Cumene)	21.2	20.0	106	73 - 133
Methyl Acetate	15.9	20.0	79	57 - 157
Methyl tert-Butyl Ether	16.2	20.0	81	75 - 126
Methylcyclohexane	22.0	20.0	110	61 - 125
Styrene	18.3	20.0	91	80 - 132
Tetrachloroethene (PCE)	20.5	20.0	102	72 - 131
Toluene	18.7	20.0	94	78 - 122
Trichloroethene (TCE)	17.5	20.0	87	74 - 127
Trichlorofluoromethane (CFC 11)	19.6	20.0	98	69 - 141
Vinyl Chloride	21.6	20.0	108	72 - 138
cis-1,2-Dichloroethene	19.1	20.0	95	78 - 122
cis-1,3-Dichloropropene	17.2	20.0	86	77 - 125
m,p-Xylenes	38.0	40.0	95	79 - 126
n-Butyl Acetate	17.5	20.0	87	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	18.5	20.0	93	75 - 121
trans-1,3-Dichloropropene	16.7	20.0	84	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 9/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256489

Lab Control Sample
RQ1107575-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.8	20.0	84	72 - 128
1,1,2,2-Tetrachloroethane	16.9	20.0	84	72 - 131
1,1,2-Trichloroethane	17.4	20.0	87	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.5	20.0	87	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.1	20.0	96	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.2	20.0	91	72 - 129
1,2,4-Trichlorobenzene	22.2	20.0	111	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	15.9	20.0	79	62 - 131
1,2-Dibromoethane	17.2	20.0	86	78 - 125
1,2-Dichlorobenzene	18.6	20.0	93	79 - 124
1,2-Dichloroethane	17.7	20.0	89	73 - 127
1,2-Dichloropropane	18.4	20.0	92	80 - 123
1,3-Dichlorobenzene	19.3	20.0	97	78 - 124
1,4-Dichlorobenzene	19.6	20.0	98	78 - 123
n-Butanol	1260	1000	125	70 - 130
2-Butanone (MEK)	16.6	20.0	83	60 - 133
2-Hexanone	16.5	20.0	83	61 - 131
4-Methyl-2-pentanone	17.3	20.0	86	61 - 132
Acetone	18.9	20.0	94	54 - 139
Benzene	17.8	20.0	89	78 - 121
Bromodichloromethane	17.3	20.0	87	80 - 125
Bromoform	16.0	20.0	80	68 - 130
Bromomethane	16.1	20.0	81	57 - 144
Carbon Disulfide	19.6	20.0	98	52 - 140
Carbon Tetrachloride	17.5	20.0	87	68 - 133
Chlorobenzene	18.1	20.0	91	80 - 121
Chloroethane	20.8	20.0	104	71 - 130
Chloroform	18.0	20.0	90	78 - 125
Chloromethane	20.1	20.0	100	61 - 138
Cyclohexane	20.6	20.0	103	57 - 126
Dibromochloromethane	17.9	20.0	90	78 - 133
Dichlorodifluoromethane (CFC 12)	22.6	20.0	113	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/ 9/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 256489

**Lab Control Sample
 RQ1107575-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.5	20.0	92	75 - 125
Ethylbenzene	18.2	20.0	91	78 - 123
Isopropylbenzene (Cumene)	20.3	20.0	102	73 - 133
Methyl Acetate	16.5	20.0	82	57 - 157
Methyl tert-Butyl Ether	16.0	20.0	80	75 - 126
Methylcyclohexane	21.4	20.0	107	61 - 125
Styrene	18.3	20.0	92	80 - 132
Tetrachloroethene (PCE)	19.6	20.0	98	72 - 131
Toluene	18.5	20.0	92	78 - 122
Trichloroethene (TCE)	17.7	20.0	88	74 - 127
Trichlorofluoromethane (CFC 11)	18.2	20.0	91	69 - 141
Vinyl Chloride	22.2	20.0	111	72 - 138
cis-1,2-Dichloroethene	18.8	20.0	94	78 - 122
cis-1,3-Dichloropropene	17.8	20.0	89	77 - 125
m,p-Xylenes	38.3	40.0	96	79 - 126
n-Butyl Acetate	17.2	20.0	86	31 - 144
o-Xylene	18.7	20.0	93	77 - 118
trans-1,2-Dichloroethene	18.2	20.0	91	75 - 121
trans-1,3-Dichloropropene	17.2	20.0	86	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Analyzed: 8/16/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 257676

Lab Control Sample
 RQ1108014-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.2	20.0	86	72 - 128
1,1,2,2-Tetrachloroethane	17.3	20.0	87	72 - 131
1,1,2-Trichloroethane	18.7	20.0	93	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.9	20.0	90	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.6	20.0	88	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.1	20.0	86	72 - 129
1,2,4-Trichlorobenzene	18.7	20.0	93	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.6	20.0	83	62 - 131
1,2-Dibromoethane	18.5	20.0	93	78 - 125
1,2-Dichlorobenzene	18.3	20.0	92	79 - 124
1,2-Dichloroethane	17.8	20.0	89	73 - 127
1,2-Dichloropropane	18.2	20.0	91	80 - 123
1,3-Dichlorobenzene	18.1	20.0	90	78 - 124
1,4-Dichlorobenzene	18.0	20.0	90	78 - 123
n-Butanol	901	1000	90	70 - 130
2-Butanone (MEK)	16.2	20.0	81	60 - 133
2-Hexanone	14.9	20.0	74	61 - 131
4-Methyl-2-pentanone	16.5	20.0	82	61 - 132
Acetone	15.9	20.0	79	54 - 139
Benzene	18.3	20.0	91	78 - 121
Bromodichloromethane	18.3	20.0	92	80 - 125
Bromoform	18.1	20.0	91	68 - 130
Bromomethane	19.2	20.0	96	57 - 144
Carbon Disulfide	21.2	20.0	106	52 - 140
Carbon Tetrachloride	17.7	20.0	89	68 - 133
Chlorobenzene	18.5	20.0	93	80 - 121
Chloroethane	19.1	20.0	95	71 - 130
Chloroform	17.9	20.0	90	78 - 125
Chloromethane	17.7	20.0	89	61 - 138
Cyclohexane	16.3	20.0	82	57 - 126
Dibromochloromethane	18.1	20.0	90	78 - 133
Dichlorodifluoromethane (CFC 12)	17.8	20.0	89	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/16/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 257676

Lab Control Sample RQ1108014-02				
Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.7	20.0	88	75 - 125
Ethylbenzene	18.7	20.0	94	78 - 123
Isopropylbenzene (Cumene)	20.3	20.0	101	73 - 133
Methyl Acetate	16.7	20.0	83	57 - 157
Methyl tert-Butyl Ether	16.8	20.0	84	75 - 126
Methylcyclohexane	17.3	20.0	87	61 - 125
Styrene	19.3	20.0	96	80 - 132
Tetrachloroethene (PCE)	19.3	20.0	96	72 - 131
Toluene	18.5	20.0	92	78 - 122
Trichloroethene (TCE)	18.7	20.0	94	74 - 127
Trichlorofluoromethane (CFC 11)	19.0	20.0	95	69 - 141
Vinyl Chloride	19.0	20.0	95	72 - 138
cis-1,2-Dichloroethene	18.7	20.0	93	78 - 122
cis-1,3-Dichloropropene	17.8	20.0	89	77 - 125
m,p-Xylenes	38.2	40.0	96	79 - 126
n-Butyl Acetate	15.3	20.0	77	31 - 144
o-Xylene	19.0	20.0	95	77 - 118
trans-1,2-Dichloroethene	17.8	20.0	89	75 - 121
trans-1,3-Dichloropropene	17.3	20.0	87	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/10/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA
Analysis Lot: 257189

Lab Control Sample
RQ1107801-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	25.0	26.1	96	56 - 148
Ethene	21.6	24.3	89	58 - 155
Methane	25.2	26.2	96	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/11/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 257194

Analyte Name	Lab Control Sample RQ1107803-02			Duplicate Lab Control Sample RQ1107803-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.8	26.1	103	25.4	26.1	97	56 - 148	5	30
Ethene	22.8	24.3	94	21.7	24.3	89	58 - 155	5	30
Methane	26.8	26.2	102	25.5	26.2	97	55 - 150	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 PED TR0272 8/2/11
 Sample Matrix: Water

Service Request: R1104287
 Date Analyzed: 8/19/11

Lab Control Sample Summary
 Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
 Basis: NA

Analysis Lot: 258188

Analyte Name	Lab Control Sample RQ1108119-02			Duplicate Lab Control Sample RQ1108119-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.21	1.00	121	1.17	1.00	117	70 - 130	3	30
Acetic Acid	9.72	10.0	97	9.76	10.0	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.2	10.0	101	9.62	10.0	96	78 - 113	5	30
Lactic Acid	9.27	9.97	93	9.39	9.97	94	61 - 109	1	30
Propionic Acid	9.64	9.97	97	9.31	9.97	93	80 - 125	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/22/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 258360

Analyte Name	Lab Control Sample RQ1108162-02			Duplicate Lab Control Sample RQ1108162-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.18	1.00	118	1.11	1.00	111	70 - 130	6	30
Acetic Acid	9.92	10.0	99	9.67	10.0	97	70 - 135	3	30
Butanoic Acid (Butyric Acid)	10.6	10.0	106	9.33	10.0	93	78 - 113	13	30
Lactic Acid	9.37	9.97	94	9.28	9.97	93	61 - 109	<1	30
Propionic Acid	9.37	9.97	94	9.47	9.97	95	80 - 125	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 PED TR0272 8/2/11
Sample Matrix: Water

Service Request: R1104287
Date Analyzed: 8/23/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 258678

Analyte Name	Lab Control Sample RQ1108248-02			Duplicate Lab Control Sample RQ1108248-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.10	1.00	110	1.13	1.00	113	70 - 130	3	30
Acetic Acid	9.75	10.0	98	9.78	10.0	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.1	10.0	101	9.71	10.0	97	78 - 113	4	30
Lactic Acid	9.23	9.97	93	9.25	9.97	93	61 - 109	<1	30
Propionic Acid	9.20	9.97	92	9.64	9.97	97	80 - 125	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0004E-024.5-201108	8/2/2011			W	16	3	2	1	3	1	3	1	1		
LC34-BW0004F-059.5-201108	8/2/2011			W	10	3	2	1	3	1	3	1	1		
LC34-BW0002A-024.5-201108 02	8/02/2011	1103	-001	W	12	3	2	1	3	3					
LC34-BW0002B-031.5-201108 02	8/02/2011	1024	-002	W	12	3	2	1	3	3					
LC34-BW0002C-038.5-201108 02	8/02/2011	0937	-003	W	15	3	2	1	3	1	3	1	1		
LC34-BW0002D-045.5-201108 02	8/02/2011	1141	-004	W	12	3	2	1	3	3					
LC34-BW0002E-052.5-201108 02	8/02/2011	1229	-005	W	12	3	2	1	3	3					
LC34-BW0002F-059.5-201108 02	8/02/2011	1311	-006	W	12	3	2	1	3	3					
LC34-BW0003A-024.5-201108 02	8/02/2011	1317	-007	W	12	3	2	1	3	3					For VOC, only 2 wells filled.
LC34-BW0003B-031.5-201108 02	8/02/2011	1222	-008	W	12	3	2	1	3	3					

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab

R1104287
 Geosyntec Consultants
 LC34 PED TR0272 8/2/11



TURNAROUND REQUIREMENTS Signature: <u>[Signature]</u> Printed Name: <u>JOSEPH BARTLETT</u> Firm: <u>GEOSYNTEC</u> Date/Time: <u>08/02/11 - 1630</u>	RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>Joseph Bartlett</u> Firm: <u>Geosyntec</u> Date/Time: <u>08/02/11 - 1630</u>
RELINQUISHED BY: Signature: <u>[Signature]</u> Printed Name: <u>Joseph Bartlett</u> Firm: <u>Geosyntec</u> Date/Time: <u>08/02/11 - 1630</u>	RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>Joseph Bartlett</u> Firm: <u>Geosyntec</u> Date/Time: <u>08/02/11 - 1630</u>

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0003C-038.5-20110802	8/02/2011	1100	-069	W	15	3	2	1	3	1	3	1	1		
LC34-BW0003D-045.5-20110802	8/02/2011	1356	-010	W	12	3	2	1	3		3				
LC34-BW0003E-052.5-20110802	8/02/2011	1022	-011	W	12	3	2	1	3		3				
LC34-BW0003F-059.5-20110802	8/02/2011	0943	-012	W	12	3	2	1	3		3				
LC34-BW0007-038.5-201108-D	8/02/2011			W	3	3									108
LC34-BW0021-027.5-201108-D	8/02/2011			W	3	3									
LC34-BW002D-037.5-201108-D	8/02/2011			W	2		2								
LC34-BW0007B-031.5-201108-D	8/02/2011			W	1			1							
LC34-BW0001D-045.5-201108-D	8/02/2011			W	1										
LC34-BW0002D-045.5-20110802-D	8/02/2011	1141	-013	W	3	3									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Jessica Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: FLD
 Firm: _____
 Date/Time: _____

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling.
 please filter in lab.

R1104287
 Geosyntec Consultants
 LC34 PED TR0272 8/2/11



RECEIVED BY:
 Signature: [Signature]
 Printed Name: Geosyntec
 Firm: CAS
 Date/Time: 8/3/11 1015

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0003B-031.5-20110802-D	8/02/2011	1222	-614	W	3				3						
LC34-BW0003C-038.5-20110802-D	8/02/2011	1100	-015	W	1					1					
LC34-BW0003D-032.0-20110802-D	8/02/2011			W	1										
LC34-BW0003E-032.5-20110802-D	8/02/2011			W	4						3			1	
LC34-BW0002F-059.5-20110802-D	8/02/2011	1311	-016	W	3										
LC34-FD-20110802-0	8/02/2011	NA		W	3										
LC34-FD-20110802-0	8/02/2011	NA		W	3										
LC34-FD-20110802-0	8/02/2011	NA		W	3										
LC34-FD-20110802-0	8/02/2011	NA		W	3										
LC34-FD-20110802-0	8/02/2011	NA		W	3										
LC34-FD-20110802-0	8/02/2011	NA	-017	W	2										

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab

R1104287
 GeoSyntec Consultants
 LC34 PED TR0272 8/2/11



TURNAROUND REQUIREMENTS
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

REPORT REQUIREMENTS
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 08/02/11 1630

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-201108-0	8/ /2011	NA		W	2		2								
LC34-FD-20110802-05	8/02/2011	NA	-019	W	1			1							
LC34-FD-20110802-06	8/02/2011	NA	-019	W	1			1							
LC34-FD-201108-0	8/ /2011	NA		W	1										
LC34-FD-20110802-03	8/02/2011	NA	-020	W	3				3						
LC34-FD-201108-0	8/ /2011	NA		W	3										
LC34-FD-201108-0	8/ /2011	NA		W	1					1					
LC34-FD-20110802-07	8/02/2011	NA	-021	W	3						3				
LC34-FD-20110802-02	8/02/2011	NA	-022	W	3						3				
LC34-FD-20110802-01	8/02/2011	NA	-023	W	1							1			

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling.
 please filter in lab



RECEIVED BY: [Signature]
 Signature: _____
 Printed Name: Jessica Bartlett
 Firm: Geosyntec
 Date/Time: 08/02/11 - 1630

RECEIVED BY: [Signature]
 Signature: _____
 Printed Name: [Signature]
 Firm: CAS
 Date/Time: 8/3/11 1015

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-20110802-04	8/02/2011	NA	-024	W	1								1		
LC34-FD-20110802-0	8/02/2011	NA	-024	W	1										
LC34-TB-20110802	8/02/2011	NA	-025	W	3	3									
LC34-TB-20110802	8/02/2011	NA	-025	W	3	3									JB
LC34-TB-20110802	8/02/2011	NA		W	3	3									
					0										
					0										
					0										
					0										
					0										

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Comments/Special Instructions:
 for dissolved metals analysis - preservative has been rinsed out of bottles before sampling, please filter in lab

R1104287

TURNAROUND REQUIREMENTS
 Signature: [Signature]
 Printed Name: JOSEPH BAATGAT
 Firm: GEOSYNTEC
 Date/Time: 08/02/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: [Name]
 Firm: [Firm]
 Date/Time: _____

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: [Name]
 Firm: CAS
 Date/Time: 8/3/11 PAS

Cooler Receipt And Preservation Check Form

Project/Client Neosyntec Folder Number R 1104287

Cooler received on 8/3/11 by: PO COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 5.3° 2.8° 3.7°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/3/11 1100

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 8/3/11

Cooler Breakdown: Date: 8/4/11 Time: 0715 by: AK

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			<u>WC103051F</u>	<u>2/16</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103095C</u>	<u>5/12</u>				
	HCl	*	*	<u>4110080</u>	<u>7/12</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 1-045-004, 1-087-002, 041111-20, 062711-22
Other Comments: _____

Bubbles - BW0002F (1 vial)
BW0003F (11)
BW0003B (11)
BW0003E (11)
BW0002A (11)
BW0002F (11)

PC Secondary Review: KB 8/30/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

4 Westard Street, Suite 250, Rochester, NY 14609 | 585.288.5380 | 800.695.7222 | 585.288.8475 (fax) PAGE 2 OF 2

Project Name: **CC34**
 Project Manager: **BOB REUTA**
 Company/Address: **GEOSYNTEC**
 6770 S. WASHINGTON AVE. STE. 3
 TITUSVILLE, FL 32780
 Phone #: **321-269-5880** E-mail: **crepta@geosyntec.com**
 Sampler's Signature: *[Signature]* Sampler's Printed Name: **David Silmar**

Project Number: **120272**
 Report CC: **-**

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	PRESERVATIVE		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	REMARKS/ ALTERNATE DESCRIPTION
						GC/MS VOAs 8260 624 CLP	GC/MS SVOAs 8270 625		
LC34-DPT0333-053.0-20110803	03103	11/22/11	1227	Soil		<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-034.5-20110803			1404			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-037.0-20110803			1413			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-045.5-20110803			1457			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-047.0-20110803			1507			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-048.5-20110803			1513			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-053.0-20110803			1522			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-DPT0334-053.0-20110803			1552	Water		<input type="checkbox"/>	<input type="checkbox"/>		
LC34-IDW183065-2010803			1600			<input type="checkbox"/>	<input type="checkbox"/>		
LC34-TB-20110803			NA	NA		<input type="checkbox"/>	<input type="checkbox"/>		

GC/MS VOAs: 8260 624 CLP
 GC/MS SVOAs: 8270 625
 PESTICIDES: 8021 601/602
 PCBs: 8081 608
 METALS TOTAL: 8082 608
 METALS DISSOLVED: (List in comments below)
 METALS TOTAL: (List in comments below)
 Preservative Key:
 0. NONE
 1. HCl
 2. HNO3
 3. H2SO4
 4. NaOH
 5. Zn Acetate
 6. MeOH
 7. NaHSO4
 8. Other: **LC3**

TURNAROUND REQUIREMENTS:
 RUSH (SURCHARGES APPLY):
 1 day 2 day 3 day
 4 day 5 day
 Standard

REPORT REQUIREMENTS:
 I. Results Only
 II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
 III. Results + QC and Calibration Summaries
 IV. Data Validation Report

FO #: _____
 BILL TO: _____

RECEIVED BY: *[Signature]* Date/Time: **11/22/11 0939**

RECEIVED BY: *[Signature]* Date/Time: **11/22/11 0939**

RECEIVED BY: *[Signature]* Date/Time: **11/22/11 0939**

RECEIVED BY: *[Signature]* Date/Time: **11/22/11 0939**

Cooler Receipt And Preservation Check Form

Project/Client Asynetic Folder Number R11-4887

Cooler received on 8/5/11 by: PO **COURIER:** CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
 3. Did all bottles arrive in good condition (unbroken)? YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A 70W 183866 (1 vial)
 5. Were **Ice** or **Ice packs** present? YES NO
 6. Where did the bottles originate? CAS/ROC, CLIENT
 7. Temperature of cooler(s) upon receipt: 3.1°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/5/11 0948
 Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 8/30/11

Cooler Breakdown: Date: 8/5/11 Time: 1706 by: DW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 2. Did all bottle labels and tags agree with custody papers? YES NO
 3. Were correct containers used for the tests indicated? YES NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
HCl	*	*							

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 1-087-002
 Other Comments: _____

PC Secondary Review: KB 8/30/11
 H:\SMODOCS\Cooler Receipt 3.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

August 25, 2011

Service Request No: R1104376

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 TR0272 Soils

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 5, 2011. For your reference, these analyses have been assigned our service request number **R1104376**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 90

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited	Nebraska Accredited
Connecticut ID # PH0556	Nevada ID # NY-00032
Delaware Accredited	New Jersey ID # NY004
DoD ELAP #65817	New York ID # 10145
Florida ID # E87674	New Hampshire ID # 294100 A/B
Illinois ID #200047	Pennsylvania ID# 68-786
Maine ID #NY0032	Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272 8/3/11
Sample Matrix: Soil

Service Request No.: R1104376
Date Received: 8/5/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Seventeen (17) soil samples were collected by the client on 8/3/11 and were received for analysis at Columbia Analytical Services on 8/5/11 via a national courier. The samples were received at a cooler temperature of 3.1°C, within the 0-6°C guidelines.

Volatile Organic Compounds

Seventeen (17) soil samples were analyzed for a client specific list of Volatile Organics by Method 8260C. All samples were analyzed for % Solids in order to report the data on a dry weight basis.

Methanol (MeOH) extracts for sample locations LC34-DPT0332-045.0-20110803 (CAS # R1104376-003), LC34-DPT0333-048.5-20110803 (CAS# R1104376-010) and LC34-DPT0334-045.5-20110803 (CAS# R1104376-014) either had some loss or no methanol in the vials. The Medium levels were prepared using the % Solids aliquots: 5 grams sample/ 10 ml MeOH on 8/15/11.

Neither low level vials for sample LC34-DPT0334-053.0-20110803 (CAS #R1104376-017) contained water in the vials. The VOC sample was prepared using % Solids aliquot jar 5 grams sample/5 ml DI on 8/16/11.

Initial and Continuing Calibration Criteria was met for all samples except the following 8260 compounds:

1,2-Dichloroethane %Differences (%D) was out at 21.7% (criteria is $\pm 20\%$) on the 8/12/11 CCV,
Vinyl Chloride (23.0%) was outside limits on the 8/13/11 CCV,
MEK (-24.3%) was out on the 8/15/11 run,
1,2-Dichloroethane (21.0%), Chloromethane (34.2%), and Vinyl Chloride (54.2%) were out on the 8/16/11 run,
and Trichloroethene (21.6%) was out on the 8/26/11 run.

When CCV %D criteria are not met, it may indicate some bias in the quantitation for that target compound in the associated samples. Any hits for these compounds in these specific runs should be considered as estimated.

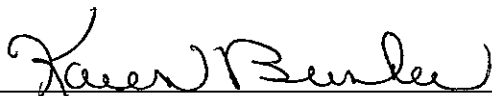
All sample surrogate recoveries were within acceptance limits.

The Internal Standards (IS) were low for sample location LC34-DPT0332-053.0-20110803 (CAS# R1104376-005). The sample was repeated and the IS results were confirmed. Matrix Interference is suspected. The IS were also low for sample LC34-DPT0333-053.0-20110803 (R1104376-011). The second vial for this location had sample encrusted in the cap and therefore a poor seal resulting in a bad purge. Data was not used from the second run attempt.

Site QC was performed on locations LC34-DTP0333-044.0-20110803 and LC34-DPT0333-045.5-20110803 (CAS # R1104376-007 and R1104376-008 respectively). The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within acceptance limits for all compounds except for n-Butanol (MS only) on the (-008) sample which was the result of carry over. All Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits except for the following:

1,2-Dichloroethane (LCS/LCSD), MEK (LCSD), Carbon Disulfide (LCSD), Chloromethane (LCS/LCSD), and Vinyl Chloride (LCS/LCSD) on the 8/16/11 analytical run.

Approved by



Date

8/7/11

00003

All Relative Percent Difference (RPD) calculations were acceptable except for n-Butanol. All exceedences have been flagged as “*”.

The laboratory attributed the LCS/LCSD recovery exceedences to problems with the Helium pressure. The affected sample locations LC34-DPT0333-048.5-20110803 (CAS# R1104376-010), LC34-DPT0334-045.5-20110803 (CAS# R1104376-014), and LC34-DPT0334-053.0-20110803 (CAS #R1104376-017) were initially run low level within holding time under this QC. The low level samples were repeated outside of holding time which mostly confirmed the initial results. Locations -010 and -014 were repeated as Medium levels using the % Solids aliquots. The Medium level analysis did not confirm the low level run hits for cis-1,2-dichloroethene and Trichloroethene for these locations however. Only the initial runs have been reported for these samples with “E” flagged results due to the estimation for over-range hits. The results for these compounds for all runs are noted in the table below for your review:

	Run 1 low level (Run QC out)	Run 2 low level (out of HT)	Medium Level (from TS aliquot)
-010 cis, 1,2-DCE	558 ppb “E”	567 ppb “E”	31 ppb
TCE	4322 ppb “E”	4342 ppb “E”	210 ppb
-014 cis 1,2-DCE	3423 ppb “E”	2678 ppb “E”	27 ppb
TCE	4903 ppb “E”	8772 ppb “E”	362 ppb

Site QC was done on location LC34-DPT0334-053.0-20110803 (R1104376-017) for % Solids and is included in the report.


Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as “J”, estimated.

Several samples had hits above the calibration range of the standards. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as “D”. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project. Carry over was noted in the initial run for locations LC34-DPT0332-048.0-20110803 (CAS #R1104376-004) and LC34-DPT0334-047.0-20110803 (CAS # R1104376-015) for N-Butanol. The samples were reanalyzed outside of holding time and the results from the reanalysis were reported for this compound only. The reanalysis results are flagged as “*”.

Samples were analyzed within the proper holding time for soils except as noted above.

The Laboratory Method Blanks were free from contamination except for Acetone in the 8/12/11 run, Acetone, Dichloromethane and Toluene on the 8/13/11 run, MEK on the 8/14/11 and medium level runs and MEK, and Acetone, Toluene and n-Butyl Acetate on the 8/16/11 low level run. Affected sample hits are flagged as “B”.

No other analytical or QC problems were encountered during the analysis of these samples.

Approved by  Date 9/7/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104376

<u>Lab ID</u>	<u>Client ID</u>
R1104376-001	LC34-DPT0332-037.0-20110803
R1104376-002	LC34-DPT0332-043.5-20110803
R1104376-003	LC34-DPT0332-045.0-20110803
R1104376-004	LC34-DPT0332-048.0-20110803
R1104376-005	LC34-DPT0332-053.0-20110803
R1104376-006	LC34-DPT0333-037.0-20110803
R1104376-007	LC34-DPT0333-044.0-20110803
R1104376-008	LC34-DPT0333-045.5-20110803
R1104376-009	LC34-DPT0333-047.0-20110803
R1104376-010	LC34-DPT0333-048.5-20110803
R1104376-011	LC34-DPT0333-053.0-20110803
R1104376-012	LC34-DPT0334-034.5-20110803
R1104376-013	LC34-DPT0334-037.0-20110803
R1104376-014	LC34-DPT0334-045.5-20110803
R1104376-015	LC34-DPT0334-047.0-20110803
R1104376-016	LC34-DPT0334-048.5-20110803
R1104376-017	LC34-DPT0334-053.0-20110803

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0332-037.0-20110803
Lab Code: R1104376-001

Service Request: R1104376
Date Collected: 8/ 3/11 0903
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	75.3	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-037.0-20110803
 Lab Code: R1104376-001

Service Request: R1104376
 Date Collected: 8/3/11 0903
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 75.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	620	U	620	45	94	NA	8/14/11 16:02		257368	
1,1,2,2-Tetrachloroethane	620	U	620	25	94	NA	8/14/11 16:02		257368	
1,1,2-Trichloroethane	620	U	620	29	94	NA	8/14/11 16:02		257368	
1,1-Dichloroethane (1,1-DCA)	620	U	620	25	94	NA	8/14/11 16:02		257368	
1,1-Dichloroethene (1,1-DCE)	620	U	620	25	94	NA	8/14/11 16:02		257368	
1,2-Dichloroethane	620	U	620	25	94	NA	8/14/11 16:02		257368	
1,2-Dichloropropane	620	U	620	32	94	NA	8/14/11 16:02		257368	
n-Butanol	100000		31000	2000	94	NA	8/14/11 16:02		257368	
2-Butanone (MEK)	620	U	620	83	94	NA	8/14/11 16:02		257368	
2-Hexanone	620	U	620	32	94	NA	8/14/11 16:02		257368	
4-Methyl-2-pentanone	620	U	620	29	94	NA	8/14/11 16:02		257368	
Acetone	620	U	620	140	94	NA	8/14/11 16:02		257368	
Benzene	620	U	620	25	94	NA	8/14/11 16:02		257368	
Bromodichloromethane	620	U	620	25	94	NA	8/14/11 16:02		257368	
Bromoform	620	U	620	30	94	NA	8/14/11 16:02		257368	
Bromomethane	620	U	620	52	94	NA	8/14/11 16:02		257368	
Carbon Disulfide	620	U	620	120	94	NA	8/14/11 16:02		257368	
Carbon Tetrachloride	620	U	620	33	94	NA	8/14/11 16:02		257368	
Chlorobenzene	620	U	620	25	94	NA	8/14/11 16:02		257368	
Chloroethane	620	U	620	48	94	NA	8/14/11 16:02		257368	
Chloroform	620	U	620	25	94	NA	8/14/11 16:02		257368	
Chloromethane	620	U	620	58	94	NA	8/14/11 16:02		257368	
Dibromochloromethane	620	U	620	25	94	NA	8/14/11 16:02		257368	
Dichloromethane	620	U	620	34	94	NA	8/14/11 16:02		257368	
Ethylbenzene	620	U	620	25	94	NA	8/14/11 16:02		257368	
Styrene	620	U	620	25	94	NA	8/14/11 16:02		257368	
Tetrachloroethene (PCE)	620	U	620	25	94	NA	8/14/11 16:02		257368	
Toluene	620	U	620	25	94	NA	8/14/11 16:02		257368	
Trichloroethene (TCE)	15000		620	25	94	NA	8/14/11 16:02		257368	
Vinyl Chloride	160	J	620	35	94	NA	8/14/11 16:02		257368	
cis-1,2-Dichloroethene	6800		620	98	94	NA	8/14/11 16:02		257368	
cis-1,3-Dichloropropene	620	U	620	25	94	NA	8/14/11 16:02		257368	
m,p-Xylenes	1200	U	1200	84	94	NA	8/14/11 16:02		257368	
n-Butyl Acetate	8300		620	25	94	NA	8/14/11 16:02		257368	
o-Xylene	620	U	620	25	94	NA	8/14/11 16:02		257368	
trans-1,2-Dichloroethene	55	J	620	29	94	NA	8/14/11 16:02		257368	
trans-1,3-Dichloropropene	620	U	620	25	94	NA	8/14/11 16:02		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-037.0-20110803
 Lab Code: R1104376-001

Service Request: R1104376
 Date Collected: 8/ 3/11 0903
 Date Received: 8/ 5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 75.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			105	85-122		8/14/11 16:02				
Dibromofluoromethane			107	89-116		8/14/11 16:02				
Toluene-d8			107	87-121		8/14/11 16:02				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0332-043.5-20110803
Lab Code: R1104376-002

Service Request: R1104376
Date Collected: 8/ 3/11 0921
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.8	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-043.5-20110803
 Lab Code: R1104376-002

Service Request: R1104376
 Date Collected: 8/3/11 0921
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 73.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2200	U	2200	160	327	NA	8/14/11 20:57		257368	
1,1,2,2-Tetrachloroethane	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
1,1,2-Trichloroethane	2200	U	2200	110	327	NA	8/14/11 20:57		257368	
1,1-Dichloroethane (1,1-DCA)	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
1,1-Dichloroethene (1,1-DCE)	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
1,2-Dichloroethane	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
1,2-Dichloropropane	2200	U	2200	120	327	NA	8/14/11 20:57		257368	
n-Butanol	36000	J	110000	6900	327	NA	8/14/11 20:57		257368	
2-Butanone (MEK)	960	BJ	2200	300	327	NA	8/14/11 20:57		257368	
2-Hexanone	2200	U	2200	120	327	NA	8/14/11 20:57		257368	
4-Methyl-2-pentanone	2200	U	2200	110	327	NA	8/14/11 20:57		257368	
Acetone	2200	U	2200	500	327	NA	8/14/11 20:57		257368	
Benzene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Bromodichloromethane	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Bromoform	2200	U	2200	110	327	NA	8/14/11 20:57		257368	
Bromomethane	2200	U	2200	190	327	NA	8/14/11 20:57		257368	
Carbon Disulfide	2200	U	2200	400	327	NA	8/14/11 20:57		257368	
Carbon Tetrachloride	2200	U	2200	120	327	NA	8/14/11 20:57		257368	
Chlorobenzene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Chloroethane	2200	U	2200	170	327	NA	8/14/11 20:57		257368	
Chloroform	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Chloromethane	2200	U	2200	210	327	NA	8/14/11 20:57		257368	
Dibromochloromethane	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Dichloromethane	2200	U	2200	120	327	NA	8/14/11 20:57		257368	
Ethylbenzene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Styrene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Tetrachloroethene (PCE)	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
Toluene	310	J	2200	89	327	NA	8/14/11 20:57		257368	
Trichloroethene (TCE)	70000		2200	89	327	NA	8/14/11 20:57		257368	
Vinyl Chloride	2200	U	2200	130	327	NA	8/14/11 20:57		257368	
cis-1,2-Dichloroethene	4500		2200	350	327	NA	8/14/11 20:57		257368	
cis-1,3-Dichloropropene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
m,p-Xylenes	4400	U	4400	300	327	NA	8/14/11 20:57		257368	
n-Butyl Acetate	38000		2200	89	327	NA	8/14/11 20:57		257368	
o-Xylene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	
trans-1,2-Dichloroethene	2200	U	2200	110	327	NA	8/14/11 20:57		257368	
trans-1,3-Dichloropropene	2200	U	2200	89	327	NA	8/14/11 20:57		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0332-043.5-20110803
Lab Code: R1104376-002

Service Request: R1104376
Date Collected: 8/3/11 0921
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 73.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			105	85-122		8/14/11 20:57				
Dibromofluoromethane			107	89-116		8/14/11 20:57				
Toluene-d8			107	87-121		8/14/11 20:57				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0332-045.0-20110803
Lab Code: R1104376-003

Service Request: R1104376
Date Collected: 8/ 3/11 0947
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	67.7	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-045.0-20110803
 Lab Code: R1104376-003

Service Request: R1104376
 Date Collected: 8/3/11 0947
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 67.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	860	U	860	62	116	NA	8/15/11 14:55		257554	
1,1,2,2-Tetrachloroethane	860	U	860	35	116	NA	8/15/11 14:55		257554	
1,1,2-Trichloroethane	860	U	860	40	116	NA	8/15/11 14:55		257554	
1,1-Dichloroethane (1,1-DCA)	860	U	860	35	116	NA	8/15/11 14:55		257554	
1,1-Dichloroethene (1,1-DCE)	860	U	860	35	116	NA	8/15/11 14:55		257554	
1,2-Dichloroethane	860	U	860	35	116	NA	8/15/11 14:55		257554	
1,2-Dichloropropane	860	U	860	43	116	NA	8/15/11 14:55		257554	
n-Butanol	9600	J	43000	2700	116	NA	8/15/11 14:55		257554	
2-Butanone (MEK)	310	BJ	860	120	116	NA	8/15/11 14:55		257554	
2-Hexanone	860	U	860	43	116	NA	8/15/11 14:55		257554	
4-Methyl-2-pentanone	860	U	860	40	116	NA	8/15/11 14:55		257554	
Acetone	860	U	860	200	116	NA	8/15/11 14:55		257554	
Benzene	860	U	860	35	116	NA	8/15/11 14:55		257554	
Bromodichloromethane	860	U	860	35	116	NA	8/15/11 14:55		257554	
Bromoform	860	U	860	42	116	NA	8/15/11 14:55		257554	
Bromomethane	860	U	860	71	116	NA	8/15/11 14:55		257554	
Carbon Disulfide	860	U	860	160	116	NA	8/15/11 14:55		257554	
Carbon Tetrachloride	860	U	860	45	116	NA	8/15/11 14:55		257554	
Chlorobenzene	860	U	860	35	116	NA	8/15/11 14:55		257554	
Chloroethane	860	U	860	66	116	NA	8/15/11 14:55		257554	
Chloroform	72	J	860	35	116	NA	8/15/11 14:55		257554	
Chloromethane	860	U	860	79	116	NA	8/15/11 14:55		257554	
Dibromochloromethane	860	U	860	35	116	NA	8/15/11 14:55		257554	
Dichloromethane	860	U	860	47	116	NA	8/15/11 14:55		257554	
Ethylbenzene	860	U	860	35	116	NA	8/15/11 14:55		257554	
Styrene	860	U	860	35	116	NA	8/15/11 14:55		257554	
Tetrachloroethene (PCE)	860	U	860	35	116	NA	8/15/11 14:55		257554	
Toluene	860	U	860	35	116	NA	8/15/11 14:55		257554	
Trichloroethene (TCE)	3400		860	35	116	NA	8/15/11 14:55		257554	
Vinyl Chloride	860	U	860	48	116	NA	8/15/11 14:55		257554	
cis-1,2-Dichloroethene	1800		860	140	116	NA	8/15/11 14:55		257554	
cis-1,3-Dichloropropene	860	U	860	35	116	NA	8/15/11 14:55		257554	
m,p-Xylenes	1700	U	1700	120	116	NA	8/15/11 14:55		257554	
n-Butyl Acetate	7700		860	35	116	NA	8/15/11 14:55		257554	
o-Xylene	860	U	860	35	116	NA	8/15/11 14:55		257554	
trans-1,2-Dichloroethene	860	U	860	40	116	NA	8/15/11 14:55		257554	
trans-1,3-Dichloropropene	860	U	860	35	116	NA	8/15/11 14:55		257554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0332-045.0-20110803
Lab Code: R1104376-003

Service Request: R1104376
Date Collected: 8/3/11 0947
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 67.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			107	85-122		8/15/11 14:55				
Dibromofluoromethane			106	89-116		8/15/11 14:55				
Toluene-d8			108	87-121		8/15/11 14:55				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0332-048.0-20110803
Lab Code: R1104376-004

Service Request: R1104376
Date Collected: 8/ 3/11 0956
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.4	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-048.0-20110803
 Lab Code: R1104376-004

Service Request: R1104376
 Date Collected: 8/3/11 0956
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 73.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	800	U	800	58	118	NA	8/14/11 16:39		257368	
1,1,2,2-Tetrachloroethane	800	U	800	33	118	NA	8/14/11 16:39		257368	
1,1,2-Trichloroethane	800	U	800	37	118	NA	8/14/11 16:39		257368	
1,1-Dichloroethane (1,1-DCA)	800	U	800	33	118	NA	8/14/11 16:39		257368	
1,1-Dichloroethene (1,1-DCE)	800	U	800	33	118	NA	8/14/11 16:39		257368	
1,2-Dichloroethane	800	U	800	33	118	NA	8/14/11 16:39		257368	
1,2-Dichloropropane	800	U	800	41	118	NA	8/14/11 16:39		257368	
n-Butanol	40000	U	40000	2500	118	NA	8/27/11 07:18		259340	*
2-Butanone (MEK)	210	BJ	800	110	118	NA	8/14/11 16:39		257368	
2-Hexanone	800	U	800	41	118	NA	8/14/11 16:39		257368	
4-Methyl-2-pentanone	800	U	800	37	118	NA	8/14/11 16:39		257368	
Acetone	270	J	800	190	118	NA	8/14/11 16:39		257368	
Benzene	800	U	800	33	118	NA	8/14/11 16:39		257368	
Bromodichloromethane	800	U	800	33	118	NA	8/14/11 16:39		257368	
Bromoform	800	U	800	39	118	NA	8/14/11 16:39		257368	
Bromomethane	800	U	800	66	118	NA	8/14/11 16:39		257368	
Carbon Disulfide	800	U	800	150	118	NA	8/14/11 16:39		257368	
Carbon Tetrachloride	800	U	800	42	118	NA	8/14/11 16:39		257368	
Chlorobenzene	800	U	800	33	118	NA	8/14/11 16:39		257368	
Chloroethane	800	U	800	62	118	NA	8/14/11 16:39		257368	
Chloroform	800	U	800	33	118	NA	8/14/11 16:39		257368	
Chloromethane	800	U	800	74	118	NA	8/14/11 16:39		257368	
Dibromochloromethane	800	U	800	33	118	NA	8/14/11 16:39		257368	
Dichloromethane	800	U	800	44	118	NA	8/14/11 16:39		257368	
Ethylbenzene	800	U	800	33	118	NA	8/14/11 16:39		257368	
Styrene	800	U	800	33	118	NA	8/14/11 16:39		257368	
Tetrachloroethene (PCE)	800	U	800	33	118	NA	8/14/11 16:39		257368	
Toluene	61	J	800	33	118	NA	8/14/11 16:39		257368	
Trichloroethene (TCE)	1800		800	33	118	NA	8/14/11 16:39		257368	
Vinyl Chloride	800	U	800	46	118	NA	8/14/11 16:39		257368	
cis-1,2-Dichloroethene	1500		800	130	118	NA	8/14/11 16:39		257368	
cis-1,3-Dichloropropene	800	U	800	33	118	NA	8/14/11 16:39		257368	
m,p-Xylenes	1600	U	1600	110	118	NA	8/14/11 16:39		257368	
n-Butyl Acetate	1100		800	33	118	NA	8/14/11 16:39		257368	
o-Xylene	800	U	800	33	118	NA	8/14/11 16:39		257368	
trans-1,2-Dichloroethene	800	U	800	37	118	NA	8/14/11 16:39		257368	
trans-1,3-Dichloropropene	800	U	800	33	118	NA	8/14/11 16:39		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-048.0-20110803
 Lab Code: R1104376-004

Service Request: R1104376
 Date Collected: 8/ 3/11 0956
 Date Received: 8/ 5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 73.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name		%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene		107	85-122		8/14/11 16:39				
Dibromofluoromethane		109	89-116		8/14/11 16:39				
Toluene-d8		104	87-121		8/14/11 16:39				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0332-053.0-20110803
Lab Code: R1104376-005

Service Request: R1104376
Date Collected: 8/ 3/11 1013
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.4	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-053.0-20110803
 Lab Code: R1104376-005

Service Request: R1104376
 Date Collected: 8/3/11 1013
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 72.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.5	U	5.5	0.26	.79	NA	8/12/11 18:49		257243	
1,1,2,2-Tetrachloroethane	5.5	U	5.5	0.39	.79	NA	8/12/11 18:49		257243	
1,1,2-Trichloroethane	5.5	U	5.5	0.31	.79	NA	8/12/11 18:49		257243	
1,1-Dichloroethane (1,1-DCA)	5.5	U	5.5	0.30	.79	NA	8/12/11 18:49		257243	
1,1-Dichloroethene (1,1-DCE)	5.5	U	5.5	0.42	.79	NA	8/12/11 18:49		257243	
1,2-Dichloroethane	5.5	U	5.5	0.33	.79	NA	8/12/11 18:49		257243	
1,2-Dichloropropane	5.5	U	5.5	0.40	.79	NA	8/12/11 18:49		257243	
n-Butanol	270	U	270	13	.79	NA	8/12/11 18:49		257243	
2-Butanone (MEK)	5.5	U	5.5	1.1	.79	NA	8/12/11 18:49		257243	
2-Hexanone	5.5	U	5.5	0.52	.79	NA	8/12/11 18:49		257243	
4-Methyl-2-pentanone	5.5	U	5.5	0.46	.79	NA	8/12/11 18:49		257243	
Acetone	31		5.5	1.3	.79	NA	8/12/11 18:49		257243	
Benzene	5.5	U	5.5	0.27	.79	NA	8/12/11 18:49		257243	
Bromodichloromethane	5.5	U	5.5	0.31	.79	NA	8/12/11 18:49		257243	
Bromoform	5.5	U	5.5	0.27	.79	NA	8/12/11 18:49		257243	
Bromomethane	5.5	U	5.5	0.38	.79	NA	8/12/11 18:49		257243	
Carbon Disulfide	14		5.5	0.31	.79	NA	8/12/11 18:49		257243	
Carbon Tetrachloride	5.5	U	5.5	0.22	.79	NA	8/12/11 18:49		257243	
Chlorobenzene	5.5	U	5.5	0.35	.79	NA	8/12/11 18:49		257243	
Chloroethane	5.5	U	5.5	0.47	.79	NA	8/12/11 18:49		257243	
Chloroform	5.5	U	5.5	0.59	.79	NA	8/12/11 18:49		257243	
Chloromethane	5.5	U	5.5	0.49	.79	NA	8/12/11 18:49		257243	
Dibromochloromethane	5.5	U	5.5	0.40	.79	NA	8/12/11 18:49		257243	
Dichloromethane	5.5	U	5.5	0.25	.79	NA	8/12/11 18:49		257243	
Ethylbenzene	5.5	U	5.5	0.47	.79	NA	8/12/11 18:49		257243	
Styrene	5.5	U	5.5	0.34	.79	NA	8/12/11 18:49		257243	
Tetrachloroethene (PCE)	5.5	U	5.5	0.63	.79	NA	8/12/11 18:49		257243	
Toluene	2.8	J	5.5	0.34	.79	NA	8/12/11 18:49		257243	
Trichloroethene (TCE)	9.8		5.5	0.56	.79	NA	8/12/11 18:49		257243	
Vinyl Chloride	5.5	U	5.5	0.52	.79	NA	8/12/11 18:49		257243	
cis-1,2-Dichloroethene	4.2	J	5.5	0.41	.79	NA	8/12/11 18:49		257243	
cis-1,3-Dichloropropene	5.5	U	5.5	0.39	.79	NA	8/12/11 18:49		257243	
m,p-Xylenes	11	U	11	0.76	.79	NA	8/12/11 18:49		257243	
n-Butyl Acetate	4.7	J	5.5	0.30	.79	NA	8/12/11 18:49		257243	
o-Xylene	5.5	U	5.5	0.35	.79	NA	8/12/11 18:49		257243	
trans-1,2-Dichloroethene	5.5	U	5.5	0.42	.79	NA	8/12/11 18:49		257243	
trans-1,3-Dichloropropene	5.5	U	5.5	0.22	.79	NA	8/12/11 18:49		257243	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0332-053.0-20110803
 Lab Code: R1104376-005

Service Request: R1104376
 Date Collected: 8/3/11 1013
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 72.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			104	77-128		8/12/11 18:49				
Dibromofluoromethane			126	65-136		8/12/11 18:49				
Toluene-d8			106	75-126		8/12/11 18:49				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-037.0-20110803
Lab Code: R1104376-006

Service Request: R1104376
Date Collected: 8/ 3/11 1114
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	78.1	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-037.0-20110803
 Lab Code: R1104376-006

Service Request: R1104376
 Date Collected: 8/3/11 1114
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 78.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	96	208	NA	8/14/11 21:34		257368	
1,1,2,2-Tetrachloroethane	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
1,1,2-Trichloroethane	1300	U	1300	62	208	NA	8/14/11 21:34		257368	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
1,2-Dichloroethane	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
1,2-Dichloropropane	1300	U	1300	67	208	NA	8/14/11 21:34		257368	
n-Butanol	33000	J	67000	4200	208	NA	8/14/11 21:34		257368	
2-Butanone (MEK)	1300	U	1300	180	208	NA	8/14/11 21:34		257368	
2-Hexanone	1300	U	1300	67	208	NA	8/14/11 21:34		257368	
4-Methyl-2-pentanone	1300	U	1300	62	208	NA	8/14/11 21:34		257368	
Acetone	1300	U	1300	300	208	NA	8/14/11 21:34		257368	
Benzene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Bromodichloromethane	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Bromoform	1300	U	1300	64	208	NA	8/14/11 21:34		257368	
Bromomethane	1300	U	1300	110	208	NA	8/14/11 21:34		257368	
Carbon Disulfide	1300	U	1300	240	208	NA	8/14/11 21:34		257368	
Carbon Tetrachloride	1300	U	1300	70	208	NA	8/14/11 21:34		257368	
Chlorobenzene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Chloroethane	1300	U	1300	110	208	NA	8/14/11 21:34		257368	
Chloroform	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Chloromethane	1300	U	1300	130	208	NA	8/14/11 21:34		257368	
Dibromochloromethane	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Dichloromethane	1300	U	1300	72	208	NA	8/14/11 21:34		257368	
Ethylbenzene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Styrene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Tetrachloroethene (PCE)	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Toluene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
Trichloroethene (TCE)	46000		1300	54	208	NA	8/14/11 21:34		257368	
Vinyl Chloride	1300	U	1300	75	208	NA	8/14/11 21:34		257368	
cis-1,2-Dichloroethene	6500		1300	210	208	NA	8/14/11 21:34		257368	
cis-1,3-Dichloropropene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
m,p-Xylenes	2700	U	2700	180	208	NA	8/14/11 21:34		257368	
n-Butyl Acetate	24000		1300	54	208	NA	8/14/11 21:34		257368	
o-Xylene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	
trans-1,2-Dichloroethene	83	J	1300	62	208	NA	8/14/11 21:34		257368	
trans-1,3-Dichloropropene	1300	U	1300	54	208	NA	8/14/11 21:34		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-037.0-20110803
Lab Code: R1104376-006

Service Request: R1104376
Date Collected: 8/3/11 1114
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 78.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			105	85-122		8/14/11 21:34				
Dibromofluoromethane			108	89-116		8/14/11 21:34				
Toluene-d8			108	87-121		8/14/11 21:34				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-044.0-20110803
Lab Code: R1104376-007

Service Request: R1104376
Date Collected: 8/ 3/11 1128
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	71.2	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-044.0-20110803
 Lab Code: R1104376-007

Service Request: R1104376
 Date Collected: 8/3/11 1128
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 71.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	3100	U	3100	150	436	NA	8/14/11 22:11		257368	
1,1,2,2-Tetrachloroethane	3100	U	3100	220	436	NA	8/14/11 22:11		257368	
1,1,2-Trichloroethane	3100	U	3100	180	436	NA	8/14/11 22:11		257368	
1,1-Dichloroethane (1,1-DCA)	3100	U	3100	170	436	NA	8/14/11 22:11		257368	
1,1-Dichloroethene (1,1-DCE)	3100	U	3100	240	436	NA	8/14/11 22:11		257368	
1,2-Dichloroethane	3100	U	3100	190	436	NA	8/14/11 22:11		257368	
1,2-Dichloropropane	3100	U	3100	230	436	NA	8/14/11 22:11		257368	
n-Butanol	150000	U	150000	7200	436	NA	8/14/11 22:11		257368	
2-Butanone (MEK)	3100	U	3100	600	436	NA	8/14/11 22:11		257368	
2-Hexanone	3100	U	3100	290	436	NA	8/14/11 22:11		257368	
4-Methyl-2-pentanone	3100	U	3100	260	436	NA	8/14/11 22:11		257368	
Acetone	4300		3100	680	436	NA	8/14/11 22:11		257368	
Benzene	3100	U	3100	150	436	NA	8/14/11 22:11		257368	
Bromodichloromethane	3100	U	3100	180	436	NA	8/14/11 22:11		257368	
Bromoform	3100	U	3100	150	436	NA	8/14/11 22:11		257368	
Bromomethane	3100	U	3100	210	436	NA	8/14/11 22:11		257368	
Carbon Disulfide	3100	U	3100	180	436	NA	8/14/11 22:11		257368	
Carbon Tetrachloride	3100	U	3100	130	436	NA	8/14/11 22:11		257368	
Chlorobenzene	3100	U	3100	200	436	NA	8/14/11 22:11		257368	
Chloroethane	3100	U	3100	270	436	NA	8/14/11 22:11		257368	
Chloroform	3100	U	3100	340	436	NA	8/14/11 22:11		257368	
Chloromethane	3100	U	3100	270	436	NA	8/14/11 22:11		257368	
Dibromochloromethane	3100	U	3100	230	436	NA	8/14/11 22:11		257368	
Dichloromethane	3100	U	3100	140	436	NA	8/14/11 22:11		257368	
Ethylbenzene	3100	U	3100	270	436	NA	8/14/11 22:11		257368	
Styrene	3100	U	3100	190	436	NA	8/14/11 22:11		257368	
Tetrachloroethene (PCE)	3100	U	3100	350	436	NA	8/14/11 22:11		257368	
Toluene	3100	U	3100	190	436	NA	8/14/11 22:11		257368	
Trichloroethene (TCE)	65000		3100	320	436	NA	8/14/11 22:11		257368	
Vinyl Chloride	3100	U	3100	290	436	NA	8/14/11 22:11		257368	
cis-1,2-Dichloroethene	1100	J	3100	230	436	NA	8/14/11 22:11		257368	
cis-1,3-Dichloropropene	3100	U	3100	220	436	NA	8/14/11 22:11		257368	
m,p-Xylenes	6100	U	6100	430	436	NA	8/14/11 22:11		257368	
n-Butyl Acetate	6400		3100	170	436	NA	8/14/11 22:11		257368	
o-Xylene	3100	U	3100	200	436	NA	8/14/11 22:11		257368	
trans-1,2-Dichloroethene	3100	U	3100	240	436	NA	8/14/11 22:11		257368	
trans-1,3-Dichloropropene	3100	U	3100	130	436	NA	8/14/11 22:11		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-044.0-20110803
Lab Code: R1104376-007

Service Request: R1104376
Date Collected: 8/3/11 1128
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 71.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			109	77-128		8/14/11 22:11				
Dibromofluoromethane			104	65-136		8/14/11 22:11				
Toluene-d8			108	75-126		8/14/11 22:11				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-045.5-20110803
Lab Code: R1104376-008

Service Request: R1104376
Date Collected: 8/ 3/11 1150
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.6	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-045.5-20110803
 Lab Code: R1104376-008

Service Request: R1104376
 Date Collected: 8/3/11 1150
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 70.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1100	U	1100	80	156	NA	8/15/11 17:04		257554	
1,1,2,2-Tetrachloroethane	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
1,1,2-Trichloroethane	1100	U	1100	51	156	NA	8/15/11 17:04		257554	
1,1-Dichloroethane (1,1-DCA)	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
1,1-Dichloroethene (1,1-DCE)	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
1,2-Dichloroethane	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
1,2-Dichloropropane	1100	U	1100	56	156	NA	8/15/11 17:04		257554	
n-Butanol	11000	J	55000	3500	156	NA	8/15/11 17:04		257554	
2-Butanone (MEK)	1100	U	1100	150	156	NA	8/15/11 17:04		257554	
2-Hexanone	1100	U	1100	56	156	NA	8/15/11 17:04		257554	
4-Methyl-2-pentanone	1100	U	1100	51	156	NA	8/15/11 17:04		257554	
Acetone	1100	U	1100	250	156	NA	8/15/11 17:04		257554	
Benzene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Bromodichloromethane	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Bromoform	1100	U	1100	54	156	NA	8/15/11 17:04		257554	
Bromomethane	1100	U	1100	91	156	NA	8/15/11 17:04		257554	
Carbon Disulfide	1100	U	1100	200	156	NA	8/15/11 17:04		257554	
Carbon Tetrachloride	1100	U	1100	58	156	NA	8/15/11 17:04		257554	
Chlorobenzene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Chloroethane	1100	U	1100	84	156	NA	8/15/11 17:04		257554	
Chloroform	60	J	1100	45	156	NA	8/15/11 17:04		257554	
Chloromethane	1100	U	1100	110	156	NA	8/15/11 17:04		257554	
Dibromochloromethane	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Dichloromethane	1100	U	1100	60	156	NA	8/15/11 17:04		257554	
Ethylbenzene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Styrene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Tetrachloroethene (PCE)	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Toluene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
Trichloroethene (TCE)	64000	D	2200	89	312	NA	8/15/11 18:18		257554	
Vinyl Chloride	1100	U	1100	62	156	NA	8/15/11 17:04		257554	
cis-1,2-Dichloroethene	3300		1100	180	156	NA	8/15/11 17:04		257554	
cis-1,3-Dichloropropene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
m,p-Xylenes	2200	U	2200	150	156	NA	8/15/11 17:04		257554	
n-Butyl Acetate	4900		1100	45	156	NA	8/15/11 17:04		257554	
o-Xylene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	
trans-1,2-Dichloroethene	64	J	1100	51	156	NA	8/15/11 17:04		257554	
trans-1,3-Dichloropropene	1100	U	1100	45	156	NA	8/15/11 17:04		257554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-045.5-20110803
Lab Code: R1104376-008

Service Request: R1104376
Date Collected: 8/ 3/11 1150
Date Received: 8/ 5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 70.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			102	85-122		8/15/11 17:04				
Dibromofluoromethane			103	89-116		8/15/11 17:04				
Toluene-d8			108	87-121		8/15/11 17:04				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-047.0-20110803
Lab Code: R1104376-009

Service Request: R1104376
Date Collected: 8/ 3/11 1155
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.3	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-047.0-20110803
 Lab Code: R1104376-009

Service Request: R1104376
 Date Collected: 8/3/11 1155
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 70.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	76	147	NA	8/14/11 17:15		257368	
1,1,2,2-Tetrachloroethane	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
1,1,2-Trichloroethane	1000	U	1000	49	147	NA	8/14/11 17:15		257368	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
1,2-Dichloroethane	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
1,2-Dichloropropane	1000	U	1000	53	147	NA	8/14/11 17:15		257368	
n-Butanol	16000	J	52000	3300	147	NA	8/14/11 17:15		257368	
2-Butanone (MEK)	360	BJ	1000	140	147	NA	8/14/11 17:15		257368	
2-Hexanone	1000	U	1000	53	147	NA	8/14/11 17:15		257368	
4-Methyl-2-pentanone	1000	U	1000	49	147	NA	8/14/11 17:15		257368	
Acetone	1000	U	1000	240	147	NA	8/14/11 17:15		257368	
Benzene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Bromodichloromethane	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Bromoform	1000	U	1000	51	147	NA	8/14/11 17:15		257368	
Bromomethane	1000	U	1000	86	147	NA	8/14/11 17:15		257368	
Carbon Disulfide	1000	U	1000	190	147	NA	8/14/11 17:15		257368	
Carbon Tetrachloride	1000	U	1000	55	147	NA	8/14/11 17:15		257368	
Chlorobenzene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Chloroethane	1000	U	1000	80	147	NA	8/14/11 17:15		257368	
Chloroform	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Chloromethane	1000	U	1000	97	147	NA	8/14/11 17:15		257368	
Dibromochloromethane	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Dichloromethane	1000	U	1000	57	147	NA	8/14/11 17:15		257368	
Ethylbenzene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Styrene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Tetrachloroethene (PCE)	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
Toluene	73	J	1000	42	147	NA	8/14/11 17:15		257368	
Trichloroethene (TCE)	37000		1000	42	147	NA	8/14/11 17:15		257368	
Vinyl Chloride	1000	U	1000	59	147	NA	8/14/11 17:15		257368	
cis-1,2-Dichloroethene	2000		1000	170	147	NA	8/14/11 17:15		257368	
cis-1,3-Dichloropropene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
m,p-Xylenes	2100	U	2100	150	147	NA	8/14/11 17:15		257368	
n-Butyl Acetate	290	J	1000	42	147	NA	8/14/11 17:15		257368	
o-Xylene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	
trans-1,2-Dichloroethene	1000	U	1000	49	147	NA	8/14/11 17:15		257368	
trans-1,3-Dichloropropene	1000	U	1000	42	147	NA	8/14/11 17:15		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-047.0-20110803
Lab Code: R1104376-009

Service Request: R1104376
Date Collected: 8/3/11 1155
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 70.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			106	85-122		8/14/11 17:15				
Dibromofluoromethane			104	89-116		8/14/11 17:15				
Toluene-d8			109	87-121		8/14/11 17:15				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-048.5-20110803
Lab Code: R1104376-010

Service Request: R1104376
Date Collected: 8/ 3/11 1157
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	66.5	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-048.5-20110803
 Lab Code: R1104376-010

Service Request: R1104376
 Date Collected: 8/3/11 1157
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 66.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	6.5	U	6.5	0.48	.87	NA	8/16/11 20:13		257758	
1,1,2,2-Tetrachloroethane	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
1,1,2-Trichloroethane	6.5	U	6.5	0.31	.87	NA	8/16/11 20:13		257758	
1,1-Dichloroethane (1,1-DCA)	0.82	J	6.5	0.27	.87	NA	8/16/11 20:13		257758	
1,1-Dichloroethene (1,1-DCE)	2.0	J	6.5	0.27	.87	NA	8/16/11 20:13		257758	
1,2-Dichloroethane	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
1,2-Dichloropropane	6.5	U	6.5	0.33	.87	NA	8/16/11 20:13		257758	
n-Butanol	14000	E	330	21	.87	NA	8/16/11 20:13		257758	
2-Butanone (MEK)	6.5	U	6.5	0.87	.87	NA	8/16/11 20:13		257758	
2-Hexanone	0.43	J	6.5	0.33	.87	NA	8/16/11 20:13		257758	
4-Methyl-2-pentanone	6.5	U	6.5	0.31	.87	NA	8/16/11 20:13		257758	
Acetone	48		6.5	1.5	.87	NA	8/16/11 20:13		257758	
Benzene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Bromodichloromethane	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Bromoform	6.5	U	6.5	0.32	.87	NA	8/16/11 20:13		257758	
Bromomethane	6.5	U	6.5	0.54	.87	NA	8/16/11 20:13		257758	
Carbon Disulfide	21		6.5	1.2	.87	NA	8/16/11 20:13		257758	
Carbon Tetrachloride	6.5	U	6.5	0.35	.87	NA	8/16/11 20:13		257758	
Chlorobenzene	0.27	J	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Chloroethane	6.5	U	6.5	0.50	.87	NA	8/16/11 20:13		257758	
Chloroform	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Chloromethane	6.5	U	6.5	0.61	.87	NA	8/16/11 20:13		257758	
Dibromochloromethane	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Dichloromethane	6.5	U	6.5	0.36	.87	NA	8/16/11 20:13		257758	
Ethylbenzene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Styrene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Tetrachloroethene (PCE)	1.1	J	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Toluene	2.9	J	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Trichloroethene (TCE)	5700	E	6.5	0.27	.87	NA	8/16/11 20:13		257758	
Vinyl Chloride	1.5	J	6.5	0.37	.87	NA	8/16/11 20:13		257758	
cis-1,2-Dichloroethene	730	E	6.5	1.1	.87	NA	8/16/11 20:13		257758	
cis-1,3-Dichloropropene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
m,p-Xylenes	13	U	13	0.88	.87	NA	8/16/11 20:13		257758	
n-Butyl Acetate	160		6.5	0.27	.87	NA	8/16/11 20:13		257758	
o-Xylene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	
trans-1,2-Dichloroethene	4.2	J	6.5	0.31	.87	NA	8/16/11 20:13		257758	
trans-1,3-Dichloropropene	6.5	U	6.5	0.27	.87	NA	8/16/11 20:13		257758	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-048.5-20110803
Lab Code: R1104376-010

Service Request: R1104376
Date Collected: 8/3/11 1157
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 66.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			110	85-122		8/16/11 20:13				
Dibromofluoromethane			112	89-116		8/16/11 20:13				
Toluene-d8			105	87-121		8/16/11 20:13				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0333-053.0-20110803
Lab Code: R1104376-011

Service Request: R1104376
Date Collected: 8/ 3/11 1227
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	71.3	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0333-053.0-20110803
 Lab Code: R1104376-011

Service Request: R1104376
 Date Collected: 8/ 3/11 1227
 Date Received: 8/ 5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 71.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.7	U	5.7	0.27	.81	NA	8/13/11 18:58		257352	
1,1,2,2-Tetrachloroethane	5.7	U	5.7	0.40	.81	NA	8/13/11 18:58		257352	
1,1,2-Trichloroethane	5.7	U	5.7	0.32	.81	NA	8/13/11 18:58		257352	
1,1-Dichloroethane (1,1-DCA)	5.7	U	5.7	0.31	.81	NA	8/13/11 18:58		257352	
1,1-Dichloroethene (1,1-DCE)	5.7	U	5.7	0.44	.81	NA	8/13/11 18:58		257352	
1,2-Dichloroethane	5.7	U	5.7	0.35	.81	NA	8/13/11 18:58		257352	
1,2-Dichloropropane	5.7	U	5.7	0.41	.81	NA	8/13/11 18:58		257352	
n-Butanol	280	U	280	14	.81	NA	8/13/11 18:58		257352	
2-Butanone (MEK)	6.1		5.7	1.2	.81	NA	8/13/11 18:58		257352	
2-Hexanone	5.7	U	5.7	0.54	.81	NA	8/13/11 18:58		257352	
4-Methyl-2-pentanone	5.7	U	5.7	0.48	.81	NA	8/13/11 18:58		257352	
Acetone	28		5.7	1.3	.81	NA	8/13/11 18:58		257352	
Benzene	5.7	U	5.7	0.28	.81	NA	8/13/11 18:58		257352	
Bromodichloromethane	5.7	U	5.7	0.32	.81	NA	8/13/11 18:58		257352	
Bromoform	5.7	U	5.7	0.28	.81	NA	8/13/11 18:58		257352	
Bromomethane	5.7	U	5.7	0.39	.81	NA	8/13/11 18:58		257352	
Carbon Disulfide	16		5.7	0.32	.81	NA	8/13/11 18:58		257352	
Carbon Tetrachloride	5.7	U	5.7	0.23	.81	NA	8/13/11 18:58		257352	
Chlorobenzene	5.7	U	5.7	0.37	.81	NA	8/13/11 18:58		257352	
Chloroethane	5.7	U	5.7	0.49	.81	NA	8/13/11 18:58		257352	
Chloroform	5.7	U	5.7	0.62	.81	NA	8/13/11 18:58		257352	
Chloromethane	5.7	U	5.7	0.50	.81	NA	8/13/11 18:58		257352	
Dibromochloromethane	5.7	U	5.7	0.41	.81	NA	8/13/11 18:58		257352	
Dichloromethane	5.7	U	5.7	0.25	.81	NA	8/13/11 18:58		257352	
Ethylbenzene	5.7	U	5.7	0.49	.81	NA	8/13/11 18:58		257352	
Styrene	5.7	U	5.7	0.36	.81	NA	8/13/11 18:58		257352	
Tetrachloroethene (PCE)	5.7	U	5.7	0.65	.81	NA	8/13/11 18:58		257352	
Toluene	0.93	BJ	5.7	0.36	.81	NA	8/13/11 18:58		257352	
Trichloroethene (TCE)	9.5		5.7	0.58	.81	NA	8/13/11 18:58		257352	
Vinyl Chloride	5.7	U	5.7	0.54	.81	NA	8/13/11 18:58		257352	
cis-1,2-Dichloroethene	2.0	J	5.7	0.43	.81	NA	8/13/11 18:58		257352	
cis-1,3-Dichloropropene	5.7	U	5.7	0.40	.81	NA	8/13/11 18:58		257352	
m,p-Xylenes	11	U	11	0.79	.81	NA	8/13/11 18:58		257352	
n-Butyl Acetate	0.87	J	5.7	0.31	.81	NA	8/13/11 18:58		257352	
o-Xylene	5.7	U	5.7	0.37	.81	NA	8/13/11 18:58		257352	
trans-1,2-Dichloroethene	5.7	U	5.7	0.44	.81	NA	8/13/11 18:58		257352	
trans-1,3-Dichloropropene	5.7	U	5.7	0.23	.81	NA	8/13/11 18:58		257352	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0333-053.0-20110803
Lab Code: R1104376-011

Service Request: R1104376
Date Collected: 8/3/11 1227
Date Received: 8/5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 71.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			107	77-128		8/13/11 18:58				
Dibromofluoromethane			115	65-136		8/13/11 18:58				
Toluene-d8			107	75-126		8/13/11 18:58				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-034.5-20110803
Lab Code: R1104376-012

Service Request: R1104376
Date Collected: 8/ 3/11 1404
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	80.4	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-034.5-20110803
 Lab Code: R1104376-012

Service Request: R1104376
 Date Collected: 8/3/11 1404
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 80.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	580	U	580	42	93.5	NA	8/14/11 17:52		257368	
1,1,2,2-Tetrachloroethane	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
1,1,2-Trichloroethane	580	U	580	27	93.5	NA	8/14/11 17:52		257368	
1,1-Dichloroethane (1,1-DCA)	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
1,1-Dichloroethene (1,1-DCE)	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
1,2-Dichloroethane	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
1,2-Dichloropropane	580	U	580	30	93.5	NA	8/14/11 17:52		257368	
n-Butanol	3700	J	29000	180093	.5	NA	8/14/11 17:52		257368	
2-Butanone (MEK)	580	U	580	77	93.5	NA	8/14/11 17:52		257368	
2-Hexanone	580	U	580	30	93.5	NA	8/14/11 17:52		257368	
4-Methyl-2-pentanone	580	U	580	27	93.5	NA	8/14/11 17:52		257368	
Acetone	580	U	580	140	93.5	NA	8/14/11 17:52		257368	
Benzene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Bromodichloromethane	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Bromoform	580	U	580	28	93.5	NA	8/14/11 17:52		257368	
Bromomethane	580	U	580	48	93.5	NA	8/14/11 17:52		257368	
Carbon Disulfide	580	U	580	110	93.5	NA	8/14/11 17:52		257368	
Carbon Tetrachloride	580	U	580	31	93.5	NA	8/14/11 17:52		257368	
Chlorobenzene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Chloroethane	580	U	580	45	93.5	NA	8/14/11 17:52		257368	
Chloroform	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Chloromethane	580	U	580	54	93.5	NA	8/14/11 17:52		257368	
Dibromochloromethane	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Dichloromethane	580	U	580	32	93.5	NA	8/14/11 17:52		257368	
Ethylbenzene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Styrene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Tetrachloroethene (PCE)	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Toluene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
Trichloroethene (TCE)	4800		580	24	93.5	NA	8/14/11 17:52		257368	
Vinyl Chloride	580	U	580	33	93.5	NA	8/14/11 17:52		257368	
cis-1,2-Dichloroethene	2700		580	91	93.5	NA	8/14/11 17:52		257368	
cis-1,3-Dichloropropene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
m,p-Xylenes	1200	U	1200	78	93.5	NA	8/14/11 17:52		257368	
n-Butyl Acetate	490	J	580	24	93.5	NA	8/14/11 17:52		257368	
o-Xylene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	
trans-1,2-Dichloroethene	50	J	580	27	93.5	NA	8/14/11 17:52		257368	
trans-1,3-Dichloropropene	580	U	580	24	93.5	NA	8/14/11 17:52		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-034.5-20110803
 Lab Code: R1104376-012

Service Request: R1104376
 Date Collected: 8/3/11 1404
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 80.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			105	85-122		8/14/11 17:52				
Dibromofluoromethane			107	89-116		8/14/11 17:52				
Toluene-d8			109	87-121		8/14/11 17:52				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-037.0-20110803
Lab Code: R1104376-013

Service Request: R1104376
Date Collected: 8/ 3/11 1413
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	74.2	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-037.0-20110803
 Lab Code: R1104376-013

Service Request: R1104376
 Date Collected: 8/ 3/11 1413
 Date Received: 8/ 5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 74.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	680	U	680	50	101.5	NA	8/14/11 18:29		257368	
1,1,2,2-Tetrachloroethane	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
1,1,2-Trichloroethane	680	U	680	32	101.5	NA	8/14/11 18:29		257368	
1,1-Dichloroethane (1,1-DCA)	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
1,1-Dichloroethene (1,1-DCE)	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
1,2-Dichloroethane	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
1,2-Dichloropropane	680	U	680	35	101.5	NA	8/14/11 18:29		257368	
n-Butanol	64000		34000	2200	101.5	NA	8/14/11 18:29		257368	
2-Butanone (MEK)	220	BJ	680	91	101.5	NA	8/14/11 18:29		257368	
2-Hexanone	680	U	680	35	101.5	NA	8/14/11 18:29		257368	
4-Methyl-2-pentanone	680	U	680	32	101.5	NA	8/14/11 18:29		257368	
Acetone	680	U	680	160	101.5	NA	8/14/11 18:29		257368	
Benzene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Bromodichloromethane	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Bromoform	680	U	680	33	101.5	NA	8/14/11 18:29		257368	
Bromomethane	680	U	680	57	101.5	NA	8/14/11 18:29		257368	
Carbon Disulfide	680	U	680	130	101.5	NA	8/14/11 18:29		257368	
Carbon Tetrachloride	680	U	680	36	101.5	NA	8/14/11 18:29		257368	
Chlorobenzene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Chloroethane	680	U	680	52	101.5	NA	8/14/11 18:29		257368	
Chloroform	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Chloromethane	680	U	680	63	101.5	NA	8/14/11 18:29		257368	
Dibromochloromethane	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Dichloromethane	680	U	680	37	101.5	NA	8/14/11 18:29		257368	
Ethylbenzene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Styrene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Tetrachloroethene (PCE)	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Toluene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
Trichloroethene (TCE)	6800		680	28	101.5	NA	8/14/11 18:29		257368	
Vinyl Chloride	300	J	680	39	101.5	NA	8/14/11 18:29		257368	
cis-1,2-Dichloroethene	7100		680	110	101.5	NA	8/14/11 18:29		257368	
cis-1,3-Dichloropropene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
m,p-Xylenes	1400	U	1400	92	101.5	NA	8/14/11 18:29		257368	
n-Butyl Acetate	57	J	680	28	101.5	NA	8/14/11 18:29		257368	
o-Xylene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	
trans-1,2-Dichloroethene	42	J	680	32	101.5	NA	8/14/11 18:29		257368	
trans-1,3-Dichloropropene	680	U	680	28	101.5	NA	8/14/11 18:29		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-037.0-20110803
 Lab Code: R1104376-013

Service Request: R1104376
 Date Collected: 8/ 3/11 1413
 Date Received: 8/ 5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 74.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			104	85-122		8/14/11 18:29				
Dibromofluoromethane			105	89-116		8/14/11 18:29				
Toluene-d8			107	87-121		8/14/11 18:29				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-045.5-20110803
Lab Code: R1104376-014

Service Request: R1104376
Date Collected: 8/ 3/11 1457
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.3	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-045.5-20110803
 Lab Code: R1104376-014

Service Request: R1104376
 Date Collected: 8/ 3/11 1457
 Date Received: 8/ 5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 70.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.8	U	5.8	0.42	.82	NA	8/16/11 21:26		257758	
1,1,2,2-Tetrachloroethane	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
1,1,2-Trichloroethane	5.8	U	5.8	0.27	.82	NA	8/16/11 21:26		257758	
1,1-Dichloroethane (1,1-DCA)	5.2	J	5.8	0.24	.82	NA	8/16/11 21:26		257758	
1,1-Dichloroethene (1,1-DCE)	9.8		5.8	0.24	.82	NA	8/16/11 21:26		257758	
1,2-Dichloroethane	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
1,2-Dichloropropane	5.8	U	5.8	0.30	.82	NA	8/16/11 21:26		257758	
n-Butanol	5700		290	18	.82	NA	8/16/11 21:26		257758	
2-Butanone (MEK)	5.8	U	5.8	0.77	.82	NA	8/16/11 21:26		257758	
2-Hexanone	5.8	U	5.8	0.30	.82	NA	8/16/11 21:26		257758	
4-Methyl-2-pentanone	5.8	U	5.8	0.27	.82	NA	8/16/11 21:26		257758	
Acetone	34	B	5.8	1.4	.82	NA	8/16/11 21:26		257758	
Benzene	0.29	J	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Bromodichloromethane	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Bromoform	5.8	U	5.8	0.28	.82	NA	8/16/11 21:26		257758	
Bromomethane	5.8	U	5.8	0.48	.82	NA	8/16/11 21:26		257758	
Carbon Disulfide	97		5.8	1.1	.82	NA	8/16/11 21:26		257758	
Carbon Tetrachloride	5.8	U	5.8	0.31	.82	NA	8/16/11 21:26		257758	
Chlorobenzene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Chloroethane	5.8	U	5.8	0.45	.82	NA	8/16/11 21:26		257758	
Chloroform	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Chloromethane	5.8	U	5.8	0.54	.82	NA	8/16/11 21:26		257758	
Dibromochloromethane	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Dichloromethane	5.8	U	5.8	0.32	.82	NA	8/16/11 21:26		257758	
Ethylbenzene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Styrene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Tetrachloroethene (PCE)	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Toluene	1.2	BJ	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Trichloroethene (TCE)	5700	E	5.8	0.24	.82	NA	8/16/11 21:26		257758	
Vinyl Chloride	2.8	J	5.8	0.33	.82	NA	8/16/11 21:26		257758	
cis-1,2-Dichloroethene	4000	E	5.8	0.91	.82	NA	8/16/11 21:26		257758	
cis-1,3-Dichloropropene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
m,p-Xylenes	12	U	12	0.79	.82	NA	8/16/11 21:26		257758	
n-Butyl Acetate	1700	E	5.8	0.24	.82	NA	8/16/11 21:26		257758	
o-Xylene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	
trans-1,2-Dichloroethene	78		5.8	0.27	.82	NA	8/16/11 21:26		257758	
trans-1,3-Dichloropropene	5.8	U	5.8	0.24	.82	NA	8/16/11 21:26		257758	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-045.5-20110803
 Lab Code: R1104376-014

Service Request: R1104376
 Date Collected: 8/3/11 1457
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 70.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			112	85-122		8/16/11 21:26				
Dibromofluoromethane			111	89-116		8/16/11 21:26				
Toluene-d8			111	87-121		8/16/11 21:26				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-047.0-20110803
Lab Code: R1104376-015

Service Request: R1104376
Date Collected: 8/ 3/11 1507
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-047.0-20110803
 Lab Code: R1104376-015

Service Request: R1104376
 Date Collected: 8/3/11 1507
 Date Received: 8/5/11

Units: µg/Kg
 Basis: Dry
 Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1200	U	1200	84	168.5	NA	8/14/11 19:06		257368	
1,1,2,2-Tetrachloroethane	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
1,1,2-Trichloroethane	1200	U	1200	54	168.5	NA	8/14/11 19:06		257368	
1,1-Dichloroethane (1,1-DCA)	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
1,1-Dichloroethene (1,1-DCE)	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
1,2-Dichloroethane	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
1,2-Dichloropropane	1200	U	1200	59	168.5	NA	8/14/11 19:06		257368	
n-Butanol	58000	U	58000	3600	168.5	NA	8/27/11 06:48		259340	*
2-Butanone (MEK)	210	BJ	1200	160	168.5	NA	8/14/11 19:06		257368	
2-Hexanone	1200	U	1200	59	168.5	NA	8/14/11 19:06		257368	
4-Methyl-2-pentanone	1200	U	1200	54	168.5	NA	8/14/11 19:06		257368	
Acetone	290	J	1200	260	168.5	NA	8/14/11 19:06		257368	
Benzene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Bromodichloromethane	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Bromoform	1200	U	1200	56	168.5	NA	8/14/11 19:06		257368	
Bromomethane	1200	U	1200	96	168.5	NA	8/14/11 19:06		257368	
Carbon Disulfide	1200	U	1200	210	168.5	NA	8/14/11 19:06		257368	
Carbon Tetrachloride	1200	U	1200	61	168.5	NA	8/14/11 19:06		257368	
Chlorobenzene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Chloroethane	1200	U	1200	89	168.5	NA	8/14/11 19:06		257368	
Chloroform	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Chloromethane	1200	U	1200	110	168.5	NA	8/14/11 19:06		257368	
Dibromochloromethane	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Dichloromethane	1200	U	1200	63	168.5	NA	8/14/11 19:06		257368	
Ethylbenzene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Styrene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Tetrachloroethene (PCE)	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
Toluene	79	J	1200	47	168.5	NA	8/14/11 19:06		257368	
Trichloroethene (TCE)	31000		1200	47	168.5	NA	8/14/11 19:06		257368	
Vinyl Chloride	1200	U	1200	65	168.5	NA	8/14/11 19:06		257368	
cis-1,2-Dichloroethene	5700		1200	190	168.5	NA	8/14/11 19:06		257368	
cis-1,3-Dichloropropene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
m,p-Xylenes	2300	U	2300	160	168.5	NA	8/14/11 19:06		257368	
n-Butyl Acetate	56	J	1200	47	168.5	NA	8/14/11 19:06		257368	
o-Xylene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	
trans-1,2-Dichloroethene	93	J	1200	54	168.5	NA	8/14/11 19:06		257368	
trans-1,3-Dichloropropene	1200	U	1200	47	168.5	NA	8/14/11 19:06		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0334-047.0-20110803
Lab Code: R1104376-015

Service Request: R1104376
Date Collected: 8/ 3/11 1507
Date Received: 8/ 5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			106	85-122		8/14/11 19:06				
Dibromofluoromethane			110	89-116		8/14/11 19:06				
Toluene-d8			107	87-121		8/14/11 19:06				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-048.5-20110803
Lab Code: R1104376-016

Service Request: R1104376
Date Collected: 8/ 3/11 1513
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.2	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-048.5-20110803
 Lab Code: R1104376-016

Service Request: R1104376
 Date Collected: 8/3/11 1513
 Date Received: 8/5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 73.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	730	U	730	53	106.5	NA	8/14/11 19:43		257368	
1,1,2,2-Tetrachloroethane	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
1,1,2-Trichloroethane	730	U	730	34	106.5	NA	8/14/11 19:43		257368	
1,1-Dichloroethane (1,1-DCA)	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
1,1-Dichloroethene (1,1-DCE)	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
1,2-Dichloroethane	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
1,2-Dichloropropane	730	U	730	37	106.5	NA	8/14/11 19:43		257368	
n-Butanol	36000	U	36000	2300	106.5	NA	8/14/11 19:43		257368	
2-Butanone (MEK)	730	U	730	97	106.5	NA	8/14/11 19:43		257368	
2-Hexanone	730	U	730	37	106.5	NA	8/14/11 19:43		257368	
4-Methyl-2-pentanone	730	U	730	34	106.5	NA	8/14/11 19:43		257368	
Acetone	730	U	730	170	106.5	NA	8/14/11 19:43		257368	
Benzene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Bromodichloromethane	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Bromoform	730	U	730	35	106.5	NA	8/14/11 19:43		257368	
Bromomethane	730	U	730	60	106.5	NA	8/14/11 19:43		257368	
Carbon Disulfide	730	U	730	140	106.5	NA	8/14/11 19:43		257368	
Carbon Tetrachloride	730	U	730	38	106.5	NA	8/14/11 19:43		257368	
Chlorobenzene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Chloroethane	730	U	730	56	106.5	NA	8/14/11 19:43		257368	
Chloroform	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Chloromethane	730	U	730	67	106.5	NA	8/14/11 19:43		257368	
Dibromochloromethane	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Dichloromethane	730	U	730	40	106.5	NA	8/14/11 19:43		257368	
Ethylbenzene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Styrene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Tetrachloroethene (PCE)	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Toluene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
Trichloroethene (TCE)	5300		730	30	106.5	NA	8/14/11 19:43		257368	
Vinyl Chloride	730	U	730	41	106.5	NA	8/14/11 19:43		257368	
cis-1,2-Dichloroethene	1400		730	120	106.5	NA	8/14/11 19:43		257368	
cis-1,3-Dichloropropene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
m,p-Xylenes	1500	U	1500	98	106.5	NA	8/14/11 19:43		257368	
n-Butyl Acetate	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
o-Xylene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	
trans-1,2-Dichloroethene	730	U	730	34	106.5	NA	8/14/11 19:43		257368	
trans-1,3-Dichloropropene	730	U	730	30	106.5	NA	8/14/11 19:43		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0334-048.5-20110803
Lab Code: R1104376-016

Service Request: R1104376
Date Collected: 8/ 3/11 1513
Date Received: 8/ 5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 73.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
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Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/14/11 19:43	
Dibromofluoromethane	105	89-116	8/14/11 19:43	
Toluene-d8	110	87-121	8/14/11 19:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: LC34-DPT0334-053.0-20110803
Lab Code: R1104376-017

Service Request: R1104376
Date Collected: 8/ 3/11 1532
Date Received: 8/ 5/11

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.2	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: LC34-DPT0334-053.0-20110803
 Lab Code: R1104376-017

Service Request: R1104376
 Date Collected: 8/ 3/11 1532
 Date Received: 8/ 5/11
 Units: µg/Kg
 Basis: Dry
 Percent Solids: 73.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	6.8	U	6.8	0.50	1	NA	8/16/11 19:00		257758	
1,1,2,2-Tetrachloroethane	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
1,1,2-Trichloroethane	6.8	U	6.8	0.32	1	NA	8/16/11 19:00		257758	
1,1-Dichloroethane (1,1-DCA)	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
1,1-Dichloroethene (1,1-DCE)	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
1,2-Dichloroethane	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
1,2-Dichloropropane	6.8	U	6.8	0.35	1	NA	8/16/11 19:00		257758	
n-Butanol	400		340	22	1	NA	8/16/11 19:00		257758	
2-Butanone (MEK)	42		6.8	0.91	1	NA	8/16/11 19:00		257758	
2-Hexanone	6.8	U	6.8	0.35	1	NA	8/16/11 19:00		257758	
4-Methyl-2-pentanone	6.8	U	6.8	0.32	1	NA	8/16/11 19:00		257758	
Acetone	28	B	6.8	1.6	1	NA	8/16/11 19:00		257758	
Benzene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Bromodichloromethane	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Bromoform	6.8	U	6.8	0.33	1	NA	8/16/11 19:00		257758	
Bromomethane	6.8	U	6.8	0.57	1	NA	8/16/11 19:00		257758	
Carbon Disulfide	5.5	J	6.8	1.3	1	NA	8/16/11 19:00		257758	
Carbon Tetrachloride	6.8	U	6.8	0.36	1	NA	8/16/11 19:00		257758	
Chlorobenzene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Chloroethane	6.8	U	6.8	0.52	1	NA	8/16/11 19:00		257758	
Chloroform	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Chloromethane	6.8	U	6.8	0.63	1	NA	8/16/11 19:00		257758	
Dibromochloromethane	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Dichloromethane	1.1	J	6.8	0.37	1	NA	8/16/11 19:00		257758	
Ethylbenzene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Styrene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Tetrachloroethene (PCE)	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
Toluene	0.57	BJ	6.8	0.28	1	NA	8/16/11 19:00		257758	
Trichloroethene (TCE)	6.0	J	6.8	0.28	1	NA	8/16/11 19:00		257758	
Vinyl Chloride	6.8	U	6.8	0.39	1	NA	8/16/11 19:00		257758	
cis-1,2-Dichloroethene	3.0	J	6.8	1.1	1	NA	8/16/11 19:00		257758	
cis-1,3-Dichloropropene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
m,p-Xylenes	14	U	14	0.92	1	NA	8/16/11 19:00		257758	
n-Butyl Acetate	7000	D	600	24	87.5	NA	8/14/11 20:20		257368	
o-Xylene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	
trans-1,2-Dichloroethene	6.8	U	6.8	0.32	1	NA	8/16/11 19:00		257758	
trans-1,3-Dichloropropene	6.8	U	6.8	0.28	1	NA	8/16/11 19:00		257758	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: LC34-DPT0334-053.0-20110803
Lab Code: R1104376-017

Service Request: R1104376
Date Collected: 8/ 3/11 1532
Date Received: 8/ 5/11
Units: µg/Kg
Basis: Dry
Percent Solids: 73.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			105	85-122		8/16/11 19:00				
Dibromofluoromethane			110	89-116		8/16/11 19:00				
Toluene-d8			110	87-121		8/16/11 19:00				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1104376-MB1

Service Request: R1104376
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	8/10/11 15:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1104376-MB2

Service Request: R1104376
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	8/19/11 10:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1107824-04

Service Request: R1104376
 Date Collected: NA
 Date Received: NA

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/12/11 14:27		257243	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.35	1	NA	8/12/11 14:27		257243	
1,1,2-Trichloroethane	5.0	U	5.0	0.28	1	NA	8/12/11 14:27		257243	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.27	1	NA	8/12/11 14:27		257243	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.38	1	NA	8/12/11 14:27		257243	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	8/12/11 14:27		257243	
1,2-Dichloropropane	5.0	U	5.0	0.36	1	NA	8/12/11 14:27		257243	
n-Butanol	250	U	250	12	1	NA	8/12/11 14:27		257243	
2-Butanone (MEK)	5.0	U	5.0	0.97	1	NA	8/12/11 14:27		257243	
2-Hexanone	5.0	U	5.0	0.47	1	NA	8/12/11 14:27		257243	
4-Methyl-2-pentanone	5.0	U	5.0	0.42	1	NA	8/12/11 14:27		257243	
Acetone	2.5	J	5.0	1.1	1	NA	8/12/11 14:27		257243	
Benzene	5.0	U	5.0	0.24	1	NA	8/12/11 14:27		257243	
Bromodichloromethane	5.0	U	5.0	0.28	1	NA	8/12/11 14:27		257243	
Bromoform	5.0	U	5.0	0.24	1	NA	8/12/11 14:27		257243	
Bromomethane	5.0	U	5.0	0.34	1	NA	8/12/11 14:27		257243	
Carbon Disulfide	5.0	U	5.0	0.28	1	NA	8/12/11 14:27		257243	
Carbon Tetrachloride	5.0	U	5.0	0.20	1	NA	8/12/11 14:27		257243	
Chlorobenzene	5.0	U	5.0	0.32	1	NA	8/12/11 14:27		257243	
Chloroethane	5.0	U	5.0	0.43	1	NA	8/12/11 14:27		257243	
Chloroform	5.0	U	5.0	0.54	1	NA	8/12/11 14:27		257243	
Chloromethane	5.0	U	5.0	0.44	1	NA	8/12/11 14:27		257243	
Dibromochloromethane	5.0	U	5.0	0.36	1	NA	8/12/11 14:27		257243	
Dichloromethane	5.0	U	5.0	0.22	1	NA	8/12/11 14:27		257243	
Ethylbenzene	5.0	U	5.0	0.43	1	NA	8/12/11 14:27		257243	
Styrene	5.0	U	5.0	0.31	1	NA	8/12/11 14:27		257243	
Tetrachloroethene (PCE)	5.0	U	5.0	0.57	1	NA	8/12/11 14:27		257243	
Toluene	5.0	U	5.0	0.31	1	NA	8/12/11 14:27		257243	
Trichloroethene (TCE)	5.0	U	5.0	0.51	1	NA	8/12/11 14:27		257243	
Vinyl Chloride	5.0	U	5.0	0.47	1	NA	8/12/11 14:27		257243	
cis-1,2-Dichloroethene	5.0	U	5.0	0.37	1	NA	8/12/11 14:27		257243	
cis-1,3-Dichloropropene	5.0	U	5.0	0.35	1	NA	8/12/11 14:27		257243	
m,p-Xylenes	10	U	10	0.69	1	NA	8/12/11 14:27		257243	
n-Butyl Acetate	5.0	U	5.0	0.27	1	NA	8/12/11 14:27		257243	
o-Xylene	5.0	U	5.0	0.32	1	NA	8/12/11 14:27		257243	
trans-1,2-Dichloroethene	5.0	U	5.0	0.38	1	NA	8/12/11 14:27		257243	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/12/11 14:27		257243	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1107824-04

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			110	77-128		8/12/11 14:27				
Dibromofluoromethane			121	65-136		8/12/11 14:27				
Toluene-d8			106	75-126		8/12/11 14:27				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1107841-04

Service Request: R1104376
 Date Collected: NA
 Date Received: NA

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	8/13/11 17:44		257352	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.35	1	NA	8/13/11 17:44		257352	
1,1,2-Trichloroethane	5.0	U	5.0	0.28	1	NA	8/13/11 17:44		257352	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.27	1	NA	8/13/11 17:44		257352	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.38	1	NA	8/13/11 17:44		257352	
1,2-Dichloroethane	5.0	U	5.0	0.30	1	NA	8/13/11 17:44		257352	
1,2-Dichloropropane	5.0	U	5.0	0.36	1	NA	8/13/11 17:44		257352	
n-Butanol	250	U	250	12	1	NA	8/13/11 17:44		257352	
2-Butanone (MEK)	5.0	U	5.0	0.97	1	NA	8/13/11 17:44		257352	
2-Hexanone	5.0	U	5.0	0.47	1	NA	8/13/11 17:44		257352	
4-Methyl-2-pentanone	5.0	U	5.0	0.42	1	NA	8/13/11 17:44		257352	
Acetone	1.7	J	5.0	1.1	1	NA	8/13/11 17:44		257352	
Benzene	5.0	U	5.0	0.24	1	NA	8/13/11 17:44		257352	
Bromodichloromethane	5.0	U	5.0	0.28	1	NA	8/13/11 17:44		257352	
Bromoform	5.0	U	5.0	0.24	1	NA	8/13/11 17:44		257352	
Bromomethane	5.0	U	5.0	0.34	1	NA	8/13/11 17:44		257352	
Carbon Disulfide	5.0	U	5.0	0.28	1	NA	8/13/11 17:44		257352	
Carbon Tetrachloride	5.0	U	5.0	0.20	1	NA	8/13/11 17:44		257352	
Chlorobenzene	5.0	U	5.0	0.32	1	NA	8/13/11 17:44		257352	
Chloroethane	5.0	U	5.0	0.43	1	NA	8/13/11 17:44		257352	
Chloroform	5.0	U	5.0	0.54	1	NA	8/13/11 17:44		257352	
Chloromethane	5.0	U	5.0	0.44	1	NA	8/13/11 17:44		257352	
Dibromochloromethane	5.0	U	5.0	0.36	1	NA	8/13/11 17:44		257352	
Dichloromethane	0.47	J	5.0	0.22	1	NA	8/13/11 17:44		257352	
Ethylbenzene	5.0	U	5.0	0.43	1	NA	8/13/11 17:44		257352	
Styrene	5.0	U	5.0	0.31	1	NA	8/13/11 17:44		257352	
Tetrachloroethene (PCE)	5.0	U	5.0	0.57	1	NA	8/13/11 17:44		257352	
Toluene	1.1	J	5.0	0.31	1	NA	8/13/11 17:44		257352	
Trichloroethene (TCE)	5.0	U	5.0	0.51	1	NA	8/13/11 17:44		257352	
Vinyl Chloride	5.0	U	5.0	0.47	1	NA	8/13/11 17:44		257352	
cis-1,2-Dichloroethene	5.0	U	5.0	0.37	1	NA	8/13/11 17:44		257352	
cis-1,3-Dichloropropene	5.0	U	5.0	0.35	1	NA	8/13/11 17:44		257352	
m,p-Xylenes	10	U	10	0.69	1	NA	8/13/11 17:44		257352	
n-Butyl Acetate	5.0	U	5.0	0.27	1	NA	8/13/11 17:44		257352	
o-Xylene	5.0	U	5.0	0.32	1	NA	8/13/11 17:44		257352	
trans-1,2-Dichloroethene	5.0	U	5.0	0.38	1	NA	8/13/11 17:44		257352	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/13/11 17:44		257352	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1107841-04

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			106	77-128		8/13/11 17:44				
Dibromofluoromethane			123	65-136		8/13/11 17:44				
Toluene-d8			103	75-126		8/13/11 17:44				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1107853-04

Service Request: R1104376
 Date Collected: NA
 Date Received: NA

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	18	50	NA	8/14/11 15:25		257368	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	8/14/11 15:25		257368	
1,1,2-Trichloroethane	250	U	250	12	50	NA	8/14/11 15:25		257368	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	8/14/11 15:25		257368	
1,1-Dichloroethene (1,1-DCE)	250	U	250	10	50	NA	8/14/11 15:25		257368	
1,2-Dichloroethane	250	U	250	10	50	NA	8/14/11 15:25		257368	
1,2-Dichloropropane	250	U	250	13	50	NA	8/14/11 15:25		257368	
n-Butanol	13000	U	13000	780	50	NA	8/14/11 15:25		257368	
2-Butanone (MEK)	66	J	250	33	50	NA	8/14/11 15:25		257368	
2-Hexanone	250	U	250	13	50	NA	8/14/11 15:25		257368	
4-Methyl-2-pentanone	250	U	250	12	50	NA	8/14/11 15:25		257368	
Acetone	250	U	250	57	50	NA	8/14/11 15:25		257368	
Benzene	250	U	250	10	50	NA	8/14/11 15:25		257368	
Bromodichloromethane	250	U	250	10	50	NA	8/14/11 15:25		257368	
Bromoform	250	U	250	12	50	NA	8/14/11 15:25		257368	
Bromomethane	250	U	250	21	50	NA	8/14/11 15:25		257368	
Carbon Disulfide	250	U	250	45	50	NA	8/14/11 15:25		257368	
Carbon Tetrachloride	250	U	250	13	50	NA	8/14/11 15:25		257368	
Chlorobenzene	250	U	250	10	50	NA	8/14/11 15:25		257368	
Chloroethane	250	U	250	19	50	NA	8/14/11 15:25		257368	
Chloroform	250	U	250	10	50	NA	8/14/11 15:25		257368	
Chloromethane	250	U	250	23	50	NA	8/14/11 15:25		257368	
Dibromochloromethane	250	U	250	10	50	NA	8/14/11 15:25		257368	
Dichloromethane	250	U	250	14	50	NA	8/14/11 15:25		257368	
Ethylbenzene	250	U	250	10	50	NA	8/14/11 15:25		257368	
Styrene	250	U	250	10	50	NA	8/14/11 15:25		257368	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	8/14/11 15:25		257368	
Toluene	250	U	250	10	50	NA	8/14/11 15:25		257368	
Trichloroethene (TCE)	250	U	250	10	50	NA	8/14/11 15:25		257368	
Vinyl Chloride	250	U	250	15	50	NA	8/14/11 15:25		257368	
cis-1,2-Dichloroethene	250	U	250	39	50	NA	8/14/11 15:25		257368	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	8/14/11 15:25		257368	
m,p-Xylenes	500	U	500	34	50	NA	8/14/11 15:25		257368	
n-Butyl Acetate	250	U	250	10	50	NA	8/14/11 15:25		257368	
o-Xylene	250	U	250	10	50	NA	8/14/11 15:25		257368	
trans-1,2-Dichloroethene	250	U	250	12	50	NA	8/14/11 15:25		257368	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	8/14/11 15:25		257368	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1107853-04

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			109	85-122		8/14/11 15:25				
Dibromofluoromethane			103	89-116		8/14/11 15:25				
Toluene-d8			111	87-121		8/14/11 15:25				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1107906-04

Service Request: R1104376
 Date Collected: NA
 Date Received: NA

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	18	50	NA	8/15/11 14:12		257554	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	8/15/11 14:12		257554	
1,1,2-Trichloroethane	250	U	250	12	50	NA	8/15/11 14:12		257554	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	8/15/11 14:12		257554	
1,1-Dichloroethene (1,1-DCE)	250	U	250	10	50	NA	8/15/11 14:12		257554	
1,2-Dichloroethane	250	U	250	10	50	NA	8/15/11 14:12		257554	
1,2-Dichloropropane	250	U	250	13	50	NA	8/15/11 14:12		257554	
n-Butanol	13000	U	13000	780	50	NA	8/15/11 14:12		257554	
2-Butanone (MEK)	86	J	250	33	50	NA	8/15/11 14:12		257554	
2-Hexanone	250	U	250	13	50	NA	8/15/11 14:12		257554	
4-Methyl-2-pentanone	250	U	250	12	50	NA	8/15/11 14:12		257554	
Acetone	250	U	250	57	50	NA	8/15/11 14:12		257554	
Benzene	250	U	250	10	50	NA	8/15/11 14:12		257554	
Bromodichloromethane	250	U	250	10	50	NA	8/15/11 14:12		257554	
Bromoform	250	U	250	12	50	NA	8/15/11 14:12		257554	
Bromomethane	250	U	250	21	50	NA	8/15/11 14:12		257554	
Carbon Disulfide	250	U	250	45	50	NA	8/15/11 14:12		257554	
Carbon Tetrachloride	250	U	250	13	50	NA	8/15/11 14:12		257554	
Chlorobenzene	250	U	250	10	50	NA	8/15/11 14:12		257554	
Chloroethane	250	U	250	19	50	NA	8/15/11 14:12		257554	
Chloroform	250	U	250	10	50	NA	8/15/11 14:12		257554	
Chloromethane	250	U	250	23	50	NA	8/15/11 14:12		257554	
Dibromochloromethane	250	U	250	10	50	NA	8/15/11 14:12		257554	
Dichloromethane	250	U	250	14	50	NA	8/15/11 14:12		257554	
Ethylbenzene	250	U	250	10	50	NA	8/15/11 14:12		257554	
Styrene	250	U	250	10	50	NA	8/15/11 14:12		257554	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	8/15/11 14:12		257554	
Toluene	250	U	250	10	50	NA	8/15/11 14:12		257554	
Trichloroethene (TCE)	250	U	250	10	50	NA	8/15/11 14:12		257554	
Vinyl Chloride	250	U	250	15	50	NA	8/15/11 14:12		257554	
cis-1,2-Dichloroethene	250	U	250	39	50	NA	8/15/11 14:12		257554	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	8/15/11 14:12		257554	
m,p-Xylenes	500	U	500	34	50	NA	8/15/11 14:12		257554	
n-Butyl Acetate	250	U	250	10	50	NA	8/15/11 14:12		257554	
o-Xylene	250	U	250	10	50	NA	8/15/11 14:12		257554	
trans-1,2-Dichloroethene	250	U	250	12	50	NA	8/15/11 14:12		257554	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	8/15/11 14:12		257554	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1107906-04

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			106	85-122		8/15/11 14:12				
Dibromofluoromethane			104	89-116		8/15/11 14:12				
Toluene-d8			109	87-121		8/15/11 14:12				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1107985-05

Service Request: R1104376
 Date Collected: NA
 Date Received: NA
 Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.36	1	NA	8/16/11 17:48		257758	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	8/16/11 17:48		257758	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
1,2-Dichloropropane	5.0	U	5.0	0.25	1	NA	8/16/11 17:48		257758	
n-Butanol	250	U	250	16	1	NA	8/16/11 17:48		257758	
2-Butanone (MEK)	1.5	J	5.0	0.66	1	NA	8/16/11 17:48		257758	
2-Hexanone	5.0	U	5.0	0.25	1	NA	8/16/11 17:48		257758	
4-Methyl-2-pentanone	5.0	U	5.0	0.23	1	NA	8/16/11 17:48		257758	
Acetone	4.0	J	5.0	1.2	1	NA	8/16/11 17:48		257758	
Benzene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Bromoform	5.0	U	5.0	0.24	1	NA	8/16/11 17:48		257758	
Bromomethane	5.0	U	5.0	0.41	1	NA	8/16/11 17:48		257758	
Carbon Disulfide	5.0	U	5.0	0.90	1	NA	8/16/11 17:48		257758	
Carbon Tetrachloride	5.0	U	5.0	0.26	1	NA	8/16/11 17:48		257758	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Chloroethane	5.0	U	5.0	0.38	1	NA	8/16/11 17:48		257758	
Chloroform	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Chloromethane	5.0	U	5.0	0.46	1	NA	8/16/11 17:48		257758	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Dichloromethane	5.0	U	5.0	0.27	1	NA	8/16/11 17:48		257758	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Styrene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Toluene	0.35	J	5.0	0.20	1	NA	8/16/11 17:48		257758	
Trichloroethene (TCE)	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
Vinyl Chloride	5.0	U	5.0	0.28	1	NA	8/16/11 17:48		257758	
cis-1,2-Dichloroethene	5.0	U	5.0	0.78	1	NA	8/16/11 17:48		257758	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
m,p-Xylenes	10	U	10	0.67	1	NA	8/16/11 17:48		257758	
n-Butyl Acetate	0.76	J	5.0	0.20	1	NA	8/16/11 17:48		257758	
o-Xylene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	
trans-1,2-Dichloroethene	5.0	U	5.0	0.23	1	NA	8/16/11 17:48		257758	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	8/16/11 17:48		257758	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1107985-05

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			108	85-122		8/16/11 17:48				
Dibromofluoromethane			115	89-116		8/16/11 17:48				
Toluene-d8			103	87-121		8/16/11 17:48				

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil
 Sample Name: Method Blank
 Lab Code: RQ1108471-04

Service Request: R1104376
 Date Collected: NA
 Date Received: NA

Units: µg/Kg
 Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	18	50	NA	8/27/11 06:18		259340	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	8/27/11 06:18		259340	
1,1,2-Trichloroethane	250	U	250	12	50	NA	8/27/11 06:18		259340	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	8/27/11 06:18		259340	
1,1-Dichloroethene (1,1-DCE)	250	U	250	10	50	NA	8/27/11 06:18		259340	
1,2-Dichloroethane	250	U	250	10	50	NA	8/27/11 06:18		259340	
1,2-Dichloropropane	250	U	250	13	50	NA	8/27/11 06:18		259340	
n-Butanol	13000	U	13000	780	50	NA	8/27/11 06:18		259340	
2-Butanone (MEK)	250	U	250	33	50	NA	8/27/11 06:18		259340	
2-Hexanone	250	U	250	13	50	NA	8/27/11 06:18		259340	
4-Methyl-2-pentanone	250	U	250	12	50	NA	8/27/11 06:18		259340	
Acetone	250	U	250	57	50	NA	8/27/11 06:18		259340	
Benzene	250	U	250	10	50	NA	8/27/11 06:18		259340	
Bromodichloromethane	250	U	250	10	50	NA	8/27/11 06:18		259340	
Bromoform	250	U	250	12	50	NA	8/27/11 06:18		259340	
Bromomethane	250	U	250	21	50	NA	8/27/11 06:18		259340	
Carbon Disulfide	250	U	250	45	50	NA	8/27/11 06:18		259340	
Carbon Tetrachloride	250	U	250	13	50	NA	8/27/11 06:18		259340	
Chlorobenzene	250	U	250	10	50	NA	8/27/11 06:18		259340	
Chloroethane	250	U	250	19	50	NA	8/27/11 06:18		259340	
Chloroform	250	U	250	10	50	NA	8/27/11 06:18		259340	
Chloromethane	250	U	250	23	50	NA	8/27/11 06:18		259340	
Dibromochloromethane	250	U	250	10	50	NA	8/27/11 06:18		259340	
Dichloromethane	250	U	250	14	50	NA	8/27/11 06:18		259340	
Ethylbenzene	250	U	250	10	50	NA	8/27/11 06:18		259340	
Styrene	250	U	250	10	50	NA	8/27/11 06:18		259340	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	8/27/11 06:18		259340	
Toluene	250	U	250	10	50	NA	8/27/11 06:18		259340	
Trichloroethene (TCE)	250	U	250	10	50	NA	8/27/11 06:18		259340	
Vinyl Chloride	250	U	250	15	50	NA	8/27/11 06:18		259340	
cis-1,2-Dichloroethene	250	U	250	39	50	NA	8/27/11 06:18		259340	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	8/27/11 06:18		259340	
m,p-Xylenes	500	U	500	34	50	NA	8/27/11 06:18		259340	
n-Butyl Acetate	250	U	250	10	50	NA	8/27/11 06:18		259340	
o-Xylene	250	U	250	10	50	NA	8/27/11 06:18		259340	
trans-1,2-Dichloroethene	250	U	250	12	50	NA	8/27/11 06:18		259340	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	8/27/11 06:18		259340	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1108471-04

Service Request: R1104376
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Surrogate Name			%Rec	Control Limits		Date Analyzed	Q			
4-Bromofluorobenzene			108	85-122		8/27/11 06:18				
Dibromofluoromethane			99	89-116		8/27/11 06:18				
Toluene-d8			107	87-121		8/27/11 06:18				

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Collected: 8/3/11
Date Received: 8/5/11
Date Analyzed: 8/19/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-DPT0334-053.0-20110803
Lab Code: R1104376-017

Units: Percent
Basis: As Received

Analyte Name	Method	MRL	Sample Result	LC34-DPT0334-053.0-20110803DUP Duplicate Sample R1104376-017DUP		RPD	RPD Limit
				Result	Average		
Solids, Total	160.3 Modified	1.0	73.2	73.1	73.1	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Collected: 8/3/11
Date Received: 8/5/11
Date Analyzed: 8/14/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS

Sample Name: LC34-DPT0333-044.0-20110803
Lab Code: R1104376-007

Units: µg/Kg
Basis: Dry

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-DPT0333-044.0-2011080 3MS Matrix Spike RQ1107853-05			LC34-DPT0333-044.0-2011080 3DMS Duplicate Matrix Spike RQ1107853-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	32200	30600	105	29800	30600	97	36 - 142	8	30
1,1,2,2-Tetrachloroethane	ND	25800	30600	84	25700	30600	84	8 - 164	<1	30
1,1,2-Trichloroethane	ND	28300	30600	92	28100	30600	92	11 - 162	<1	30
1,1-Dichloroethane (1,1-DCA)	ND	31700	30600	104	30200	30600	99	37 - 146	5	30
1,1-Dichloroethene (1,1-DCE)	ND	27500	30600	90	27100	30600	88	24 - 166	2	30
1,2-Dichloroethane	ND	35600	30600	116	33900	30600	111	33 - 144	5	30
1,2-Dichloropropane	ND	31700	30600	104	31200	30600	102	35 - 140	2	30
n-Butanol	ND	1500000	1530000	98	1700000	1530000	111	50 - 150	12	30
2-Butanone (MEK)	ND	25000	30600	82	24800	30600	81	33 - 140	<1	30
2-Hexanone	ND	26200	30600	86	26000	30600	85	5 - 161	<1	30
4-Methyl-2-pentanone	ND	28200	30600	92	28600	30600	94	24 - 155	2	30
Acetone	4300	32400	30600	92	33400	30600	95	6 - 193	3	30
Benzene	ND	30500	30600	100	29500	30600	96	38 - 132	3	30
Bromodichloromethane	ND	32800	30600	107	31000	30600	101	24 - 143	6	30
Bromoform	ND	30800	30600	101	29800	30600	97	8 - 154	4	30
Bromomethane	ND	25100	30600	82	25500	30600	83	21 - 144	1	30
Carbon Disulfide	ND	27500	30600	90	27900	30600	91	26 - 137	1	30
Carbon Tetrachloride	ND	34800	30600	114	31900	30600	104	25 - 141	9	30
Chlorobenzene	ND	30500	30600	100	29500	30600	96	19 - 140	3	30
Chloroethane	ND	32200	30600	105	30900	30600	101	36 - 145	4	30
Chloroform	ND	30800	30600	101	30100	30600	98	34 - 148	2	30
Chloromethane	ND	39500	30600	129	39100	30600	128	36 - 144	<1	30
Dibromochloromethane	ND	31400	30600	102	30400	30600	99	21 - 147	3	30
Dichloromethane	ND	29500	30600	96	28800	30600	94	40 - 137	2	30
Ethylbenzene	ND	32000	30600	105	29500	30600	96	15 - 147	8	30
Styrene	ND	31900	30600	104	29700	30600	97	17 - 137	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Collected: 8/3/11
Date Received: 8/5/11
Date Analyzed: 8/14/11

**Matrix Spike Summary
 Volatile Organic Compounds by GC/MS**

Sample Name: LC34-DPT0333-044.0-20110803
Lab Code: R1104376-007

Units: µg/Kg
Basis: Dry

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-DPT0333-044.0-2011080 3MS Matrix Spike RQ1107853-05			LC34-DPT0333-044.0-2011080 3DMS Duplicate Matrix Spike RQ1107853-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Tetrachloroethene (PCE)	ND	33700	30600	110	30600	30600	100	16 - 141	10	30
Toluene	ND	31700	30600	104	29600	30600	97	22 - 148	7	30
Trichloroethene (TCE)	65000	95300	30600	100	94400	30600	96	10 - 182	1	30
Vinyl Chloride	ND	39800	30600	130	37700	30600	123	35 - 154	5	30
cis-1,2-Dichloroethene	1100	31800	30600	101	30200	30600	95	27 - 146	5	30
cis-1,3-Dichloropropene	ND	30700	30600	100	29100	30600	95	18 - 133	5	30
m,p-Xylenes	ND	64400	61200	105	60700	61200	99	12 - 146	6	30
n-Butyl Acetate	6400	33900	30600	90	35100	30600	94	10 - 151	4	30
o-Xylene	ND	32500	30600	106	29300	30600	96	13 - 149	10	30
trans-1,2-Dichloroethene	ND	27400	30600	89	27100	30600	89	32 - 140	<1	30
trans-1,3-Dichloropropene	ND	28800	30600	94	28300	30600	92	10 - 147	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils 8/3/11
 Sample Matrix: Soil

Service Request: R1104376
 Date Collected: 8/3/11
 Date Received: 8/5/11
 Date Analyzed: 8/15/11

Matrix Spike Summary
 Volatile Organic Compounds by GC/MS

Sample Name: LC34-DPT0333-045.5-20110803
 Lab Code: R1104376-008

Units: µg/Kg
 Basis: Dry

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-DPT0333-045.5-2011080 3MS Matrix Spike RQ1107906-05			LC34-DPT0333-045.5-2011080 3DMS Duplicate Matrix Spike RQ1107906-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	22000	22100	99	20700	22100	93	76 - 142	6	30
1,1,2,2-Tetrachloroethane	ND	17900	22100	81	18200	22100	82	71 - 120	2	30
1,1,2-Trichloroethane	ND	20300	22100	92	19000	22100	86	80 - 119	7	30
1,1-Dichloroethane (1,1-DCA)	ND	22400	22100	101	21000	22100	95	79 - 134	6	30
1,1-Dichloroethene (1,1-DCE)	ND	18800	22100	85	18100	22100	82	71 - 143	4	30
1,2-Dichloroethane	ND	24600	22100	111	24400	22100	110	73 - 133	<1	30
1,2-Dichloropropane	ND	22300	22100	101	21500	22100	97	84 - 124	4	30
n-Butanol	11000	3490000	1110000	314 *	1430000	1110000	128	50 - 150	84 *	30
2-Butanone (MEK)	ND	17800	22100	81	17400	22100	79	54 - 130	2	30
2-Hexanone	ND	19700	22100	89	18300	22100	83	55 - 125	7	30
4-Methyl-2-pentanone	ND	20100	22100	91	19600	22100	89	59 - 131	3	30
Acetone	ND	20000	22100	91	20200	22100	91	37 - 152	<1	30
Benzene	ND	20500	22100	93	20500	22100	93	81 - 124	<1	30
Bromodichloromethane	ND	22200	22100	101	21700	22100	98	81 - 126	2	30
Bromoform	ND	20900	22100	95	20800	22100	94	61 - 126	<1	30
Bromomethane	ND	18700	22100	85	18100	22100	82	45 - 154	4	30
Carbon Disulfide	ND	20600	22100	93	20200	22100	91	32 - 149	2	30
Carbon Tetrachloride	ND	22800	22100	103	22500	22100	102	71 - 146	2	30
Chlorobenzene	ND	20700	22100	94	20500	22100	93	80 - 125	1	30
Chloroethane	ND	22000	22100	99	21700	22100	98	68 - 148	1	30
Chloroform	60	21900	22100	99	20900	22100	94	81 - 131	5	30
Chloromethane	ND	26300	22100	119	25700	22100	116	61 - 151	2	30
Dibromochloromethane	ND	21900	22100	99	21400	22100	97	74 - 130	3	30
Dichloromethane	ND	20300	22100	92	19600	22100	89	78 - 125	4	30
Ethylbenzene	ND	21000	22100	95	20800	22100	94	84 - 127	1	30
Styrene	ND	21200	22100	96	20800	22100	94	43 - 146	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Collected: 8/3/11
Date Received: 8/5/11
Date Analyzed: 8/15/11

**Matrix Spike Summary
 Volatile Organic Compounds by GC/MS**

Sample Name: LC34-DPT0333-045.5-20110803
Lab Code: R1104376-008

Units: µg/Kg
Basis: Dry

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-DPT0333-045.5-2011080 3MS Matrix Spike RQ1107906-05			LC34-DPT0333-045.5-2011080 3DMS Duplicate Matrix Spike RQ1107906-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Tetrachloroethene (PCE)	ND	22400	22100	101	21700	22100	98	66 - 142	3	30
Toluene	ND	21100	22100	96	21000	22100	95	81 - 125	<1	30
Trichloroethene (TCE)	64000	84700	22100	96	84700	22100	96	71 - 133	<1	30
Vinyl Chloride	ND	26100	22100	118	24400	22100	110	72 - 154	7	30
cis-1,2-Dichloroethene	3300	24400	22100	96	23300	22100	91	72 - 137	4	30
cis-1,3-Dichloropropene	ND	20900	22100	95	20700	22100	94	71 - 120	1	30
m,p-Xylenes	ND	42600	44200	96	41600	44200	94	80 - 129	2	30
n-Butyl Acetate	4900	29000	22100	109	26600	22100	98	18 - 159	9	30
o-Xylene	ND	21300	22100	96	21000	22100	95	80 - 126	1	30
trans-1,2-Dichloroethene	64	19400	22100	88	19100	22100	86	77 - 130	2	30
trans-1,3-Dichloropropene	ND	20800	22100	94	20700	22100	94	67 - 122	<1	30

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/12/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257243

**Lab Control Sample
 RQ1107824-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.5	20.0	107	68 - 129
1,1,2,2-Tetrachloroethane	19.2	20.0	96	72 - 133
1,1,2-Trichloroethane	19.2	20.0	96	75 - 123
1,1-Dichloroethane (1,1-DCA)	22.4	20.0	112	71 - 129
1,1-Dichloroethene (1,1-DCE)	18.3	20.0	91	71 - 133
1,2-Dichloroethane	25.8	20.0	129	69 - 129
1,2-Dichloropropane	21.7	20.0	108	76 - 123
2-Butanone (MEK)	22.4	20.0	112	69 - 129
2-Hexanone	20.4	20.0	102	62 - 130
4-Methyl-2-pentanone	20.3	20.0	102	64 - 136
Acetone	22.0	20.0	110	53 - 148
Benzene	20.5	20.0	102	74 - 120
Bromodichloromethane	21.8	20.0	109	74 - 123
Bromoform	19.7	20.0	98	67 - 129
Bromomethane	18.4	20.0	92	53 - 143
Carbon Disulfide	23.7	20.0	118	58 - 139
Carbon Tetrachloride	23.2	20.0	116	62 - 136
Chlorobenzene	20.4	20.0	102	72 - 126
Chloroethane	23.1	20.0	116	69 - 136
Chloroform	21.8	20.0	109	72 - 128
Chloromethane	25.9	20.0	130	60 - 140
Dibromochloromethane	20.1	20.0	100	70 - 133
Dichloromethane	19.9	20.0	100	75 - 122
Ethylbenzene	20.0	20.0	100	68 - 129
Styrene	20.2	20.0	101	68 - 125
Tetrachloroethene (PCE)	18.7	20.0	93	64 - 133
Toluene	20.2	20.0	101	70 - 126
Trichloroethene (TCE)	19.5	20.0	98	71 - 125
Vinyl Chloride	27.9	20.0	140	65 - 143
cis-1,2-Dichloroethene	20.7	20.0	104	74 - 125
cis-1,3-Dichloropropene	20.9	20.0	105	71 - 118
m,p-Xylenes	40.6	40.0	102	68 - 129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/12/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257243

Lab Control Sample
RQ1107824-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
o-Xylene	20.3	20.0	102	69 - 127
trans-1,2-Dichloroethene	18.9	20.0	95	71 - 127
trans-1,3-Dichloropropene	20.0	20.0	100	70 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils
 Sample Matrix: Soil

Service Request: R1104376
 Date Analyzed: 8/13/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
 Basis: Dry

Analysis Lot: 257352

Lab Control Sample
 RQ1107841-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.7	20.0	93	68 - 129
1,1,2,2-Tetrachloroethane	18.7	20.0	93	72 - 133
1,1,2-Trichloroethane	18.3	20.0	92	75 - 123
1,1-Dichloroethane (1,1-DCA)	19.8	20.0	99	71 - 129
1,1-Dichloroethene (1,1-DCE)	16.4	20.0	82	71 - 133
1,2-Dichloroethane	24.2	20.0	121	69 - 129
1,2-Dichloropropane	20.0	20.0	100	76 - 123
2-Butanone (MEK)	22.2	20.0	111	69 - 129
2-Hexanone	22.0	20.0	110	62 - 130
4-Methyl-2-pentanone	21.6	20.0	108	64 - 136
Acetone	22.1	20.0	110	53 - 148
Benzene	18.3	20.0	92	74 - 120
Bromodichloromethane	20.6	20.0	103	74 - 123
Bromoform	19.5	20.0	97	67 - 129
Bromomethane	16.9	20.0	84	53 - 143
Carbon Disulfide	23.1	20.0	116	58 - 139
Carbon Tetrachloride	18.5	20.0	92	62 - 136
Chlorobenzene	17.9	20.0	90	72 - 126
Chloroethane	20.3	20.0	102	69 - 136
Chloroform	19.4	20.0	97	72 - 128
Chloromethane	24.2	20.0	121	60 - 140
Dibromochloromethane	18.9	20.0	94	70 - 133
Dichloromethane	18.7	20.0	94	75 - 122
Ethylbenzene	16.9	20.0	84	68 - 129
Styrene	18.2	20.0	91	68 - 125
Tetrachloroethene (PCE)	16.5	20.0	82	64 - 133
Toluene	17.5	20.0	88	70 - 126
Trichloroethene (TCE)	18.3	20.0	92	71 - 125
Vinyl Chloride	26.7	20.0	134	65 - 143
cis-1,2-Dichloroethene	18.5	20.0	93	74 - 125
cis-1,3-Dichloropropene	19.8	20.0	99	71 - 118
m,p-Xylenes	35.0	40.0	88	68 - 129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils
 Sample Matrix: Soil

Service Request: R1104376
 Date Analyzed: 8/13/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
 Basis: Dry

Analysis Lot: 257352

Lab Control Sample
 RQ1107841-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
o-Xylene	17.4	20.0	87	69 - 127
trans-1,2-Dichloroethene	17.4	20.0	87	71 - 127
trans-1,3-Dichloropropene	18.5	20.0	92	70 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/14/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257368

**Lab Control Sample
 RQ1107853-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.6	20.0	98	68 - 129
1,1,2,2-Tetrachloroethane	16.2	20.0	81	72 - 133
1,1,2-Trichloroethane	16.8	20.0	84	75 - 123
1,1-Dichloroethane (1,1-DCA)	19.9	20.0	99	71 - 129
1,1-Dichloroethene (1,1-DCE)	17.7	20.0	88	71 - 133
1,2-Dichloroethane	22.0	20.0	110	69 - 129
1,2-Dichloropropane	20.5	20.0	103	76 - 123
2-Butanone (MEK)	15.5	20.0	77	69 - 129
2-Hexanone	15.8	20.0	79	62 - 130
4-Methyl-2-pentanone	16.7	20.0	84	64 - 136
Acetone	19.3	20.0	96	53 - 148
Benzene	19.2	20.0	96	74 - 120
Bromodichloromethane	19.9	20.0	100	74 - 123
Bromoform	17.8	20.0	89	67 - 129
Bromomethane	17.6	20.0	88	53 - 143
Carbon Disulfide	19.1	20.0	95	58 - 139
Carbon Tetrachloride	21.0	20.0	105	62 - 136
Chlorobenzene	19.0	20.0	95	72 - 126
Chloroethane	20.6	20.0	103	69 - 136
Chloroform	19.7	20.0	99	72 - 128
Chloromethane	24.3	20.0	121	60 - 140
Dibromochloromethane	19.0	20.0	95	70 - 133
Dichloromethane	18.9	20.0	94	75 - 122
Ethylbenzene	19.6	20.0	98	68 - 129
Styrene	19.2	20.0	96	68 - 125
Tetrachloroethene (PCE)	20.2	20.0	101	64 - 133
Toluene	19.5	20.0	98	70 - 126
Trichloroethene (TCE)	19.6	20.0	98	71 - 125
Vinyl Chloride	24.9	20.0	125	65 - 143
cis-1,2-Dichloroethene	19.3	20.0	97	74 - 125
cis-1,3-Dichloropropene	19.0	20.0	95	71 - 118
m,p-Xylenes	39.8	40.0	99	68 - 129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/14/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257368

Lab Control Sample
RQ1107853-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
o-Xylene	19.6	20.0	98	69 - 127
trans-1,2-Dichloroethene	18.2	20.0	91	71 - 127
trans-1,3-Dichloropropene	18.7	20.0	94	70 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/15/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257554

**Lab Control Sample
 RQ1107906-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.4	20.0	97	68 - 129
1,1,2,2-Tetrachloroethane	16.2	20.0	81	72 - 133
1,1,2-Trichloroethane	17.4	20.0	87	75 - 123
1,1-Dichloroethane (1,1-DCA)	19.9	20.0	100	71 - 129
1,1-Dichloroethene (1,1-DCE)	17.1	20.0	86	71 - 133
1,2-Dichloroethane	21.6	20.0	108	69 - 129
1,2-Dichloropropane	19.6	20.0	98	76 - 123
2-Butanone (MEK)	14.9	20.0	74	69 - 129
2-Hexanone	16.0	20.0	80	62 - 130
4-Methyl-2-pentanone	16.0	20.0	80	64 - 136
Acetone	20.2	20.0	101	53 - 148
Benzene	18.4	20.0	92	74 - 120
Bromodichloromethane	20.1	20.0	100	74 - 123
Bromoform	17.7	20.0	89	67 - 129
Bromomethane	17.8	20.0	89	53 - 143
Carbon Disulfide	18.4	20.0	92	58 - 139
Carbon Tetrachloride	20.9	20.0	104	62 - 136
Chlorobenzene	19.3	20.0	97	72 - 126
Chloroethane	21.0	20.0	105	69 - 136
Chloroform	19.2	20.0	96	72 - 128
Chloromethane	24.0	20.0	120	60 - 140
Dibromochloromethane	19.2	20.0	96	70 - 133
Dichloromethane	17.4	20.0	87	75 - 122
Ethylbenzene	19.4	20.0	97	68 - 129
Styrene	19.2	20.0	96	68 - 125
Tetrachloroethene (PCE)	21.1	20.0	106	64 - 133
Toluene	19.0	20.0	95	70 - 126
Trichloroethene (TCE)	19.7	20.0	99	71 - 125
Vinyl Chloride	23.9	20.0	120	65 - 143
cis-1,2-Dichloroethene	19.1	20.0	95	74 - 125
cis-1,3-Dichloropropene	19.1	20.0	96	71 - 118
m,p-Xylenes	39.4	40.0	99	68 - 129

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: LC34 TR0272 Soils
 Sample Matrix: Soil

Service Request: R1104376
 Date Analyzed: 8/15/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
 Basis: Dry

Analysis Lot: 257554

Lab Control Sample
 RQ1107906-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
o-Xylene	19.3	20.0	97	69 - 127
trans-1,2-Dichloroethene	17.4	20.0	87	71 - 127
trans-1,3-Dichloropropene	18.0	20.0	90	70 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/16/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 257758

Analyte Name	Lab Control Sample RQ1107985-03			Duplicate Lab Control Sample RQ1107985-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	22.4	20.0	112	24.7	20.0	124	68 - 129	10	30
1,1,2,2-Tetrachloroethane	18.5	20.0	92	17.9	20.0	90	72 - 133	3	30
1,1,2-Trichloroethane	17.6	20.0	88	18.6	20.0	93	75 - 123	6	30
1,1-Dichloroethane (1,1-DCA)	22.3	20.0	112	24.3	20.0	121	71 - 129	8	30
1,1-Dichloroethene (1,1-DCE)	19.1	20.0	95	19.9	20.0	99	71 - 133	4	30
1,2-Dichloroethane	25.9	20.0	130 *	27.4	20.0	137 *	69 - 129	6	30
1,2-Dichloropropane	21.4	20.0	107	24.1	20.0	120	76 - 123	12	30
2-Butanone (MEK)	24.2	20.0	121	26.4	20.0	132 *	69 - 129	9	30
2-Hexanone	21.1	20.0	105	22.1	20.0	110	62 - 130	5	30
4-Methyl-2-pentanone	19.4	20.0	97	21.9	20.0	110	64 - 136	12	30
Acetone	24.5	20.0	122	28.8	20.0	144	53 - 148	16	30
Benzene	20.1	20.0	100	21.7	20.0	108	74 - 120	8	30
Bromodichloromethane	21.7	20.0	108	23.5	20.0	117	74 - 123	8	30
Bromoform	18.7	20.0	93	20.2	20.0	101	67 - 129	8	30
Bromomethane	18.4	20.0	92	20.0	20.0	100	53 - 143	9	30
Carbon Disulfide	23.9	20.0	119	28.2	20.0	141 *	58 - 139	17	30
Carbon Tetrachloride	23.0	20.0	115	26.8	20.0	134	62 - 136	15	30
Chlorobenzene	18.7	20.0	94	20.7	20.0	103	72 - 126	10	30
Chloroethane	22.7	20.0	114	24.3	20.0	121	69 - 136	7	30
Chloroform	22.2	20.0	111	23.2	20.0	116	72 - 128	5	30
Chloromethane	29.2	20.0	146 *	32.3	20.0	162 *	60 - 140	10	30
Dibromochloromethane	18.4	20.0	92	19.6	20.0	98	70 - 133	7	30
Dichloromethane	21.2	20.0	106	21.4	20.0	107	75 - 122	<1	30
Ethylbenzene	19.1	20.0	95	21.4	20.0	107	68 - 129	12	30
Styrene	18.8	20.0	94	20.6	20.0	103	68 - 125	9	30
Tetrachloroethene (PCE)	18.4	20.0	92	20.6	20.0	103	64 - 133	11	30
Toluene	19.0	20.0	95	21.4	20.0	107	70 - 126	12	30
Trichloroethene (TCE)	20.3	20.0	102	23.3	20.0	116	71 - 125	13	30
Vinyl Chloride	35.8	20.0	179 *	37.1	20.0	185 *	65 - 143	3	30
cis-1,2-Dichloroethene	21.4	20.0	107	22.2	20.0	111	74 - 125	4	30
cis-1,3-Dichloropropene	20.1	20.0	101	21.2	20.0	106	71 - 118	5	30
m,p-Xylenes	38.9	40.0	97	43.1	40.0	108	68 - 129	10	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/16/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 257758

Analyte Name	Lab Control Sample RQ1107985-03			Duplicate Lab Control Sample RQ1107985-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
o-Xylene	19.6	20.0	98	20.6	20.0	103	69 - 127	5	30
trans-1,2-Dichloroethene	20.6	20.0	103	21.1	20.0	105	71 - 127	2	30
trans-1,3-Dichloropropene	17.9	20.0	90	19.1	20.0	95	70 - 120	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/26/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 259340

**Lab Control Sample
 RQ1108471-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.3	20.0	91	72 - 128
1,1,2,2-Tetrachloroethane	19.1	20.0	96	72 - 131
1,1,2-Trichloroethane	19.9	20.0	100	80 - 122
1,1-Dichloroethane (1,1-DCA)	19.7	20.0	98	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.5	20.0	97	72 - 129
1,2-Dichloroethane	17.6	20.0	88	73 - 127
1,2-Dichloropropane	20.4	20.0	102	80 - 123
n-Butanol	1010	1000	101	70 - 130
2-Butanone (MEK)	18.5	20.0	92	60 - 133
2-Hexanone	21.7	20.0	108	61 - 131
4-Methyl-2-pentanone	20.1	20.0	100	61 - 132
Acetone	18.5	20.0	93	54 - 139
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	19.1	20.0	95	80 - 125
Bromoform	21.0	20.0	105	68 - 130
Bromomethane	18.5	20.0	93	57 - 144
Carbon Disulfide	23.2	20.0	116	52 - 140
Carbon Tetrachloride	20.1	20.0	100	68 - 133
Chlorobenzene	20.5	20.0	102	80 - 121
Chloroethane	20.4	20.0	102	71 - 130
Chloroform	19.4	20.0	97	78 - 125
Chloromethane	18.7	20.0	93	61 - 138
Dibromochloromethane	20.0	20.0	100	78 - 133
Dichloromethane	19.4	20.0	97	75 - 125
Ethylbenzene	21.1	20.0	106	78 - 123
Styrene	20.9	20.0	105	80 - 132
Tetrachloroethene (PCE)	20.8	20.0	104	72 - 131
Toluene	21.3	20.0	107	78 - 122
Trichloroethene (TCE)	22.3	20.0	112	74 - 127
Vinyl Chloride	20.7	20.0	103	72 - 138
cis-1,2-Dichloroethene	19.6	20.0	98	78 - 122
cis-1,3-Dichloropropene	18.9	20.0	95	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 TR0272 Soils 8/3/11
Sample Matrix: Soil

Service Request: R1104376
Date Analyzed: 8/26/11

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry
Analysis Lot: 259340

Lab Control Sample
RQ1108471-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	42.1	40.0	105	79 - 126
n-Butyl Acetate	21.5	20.0	107	31 - 144
o-Xylene	21.0	20.0	105	77 - 118
trans-1,2-Dichloroethene	20.7	20.0	104	75 - 121
trans-1,3-Dichloropropene	18.4	20.0	92	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

Project Name **LC34** | Project Number **TK0272** | Report CC **-** | ANALYSIS REQUESTED (Include Method Number and Container Preservative)

Project Manager **Corey Repta** | Company/Address **GEOSYNTEC** | PRESERVATIVE

6770 S. WASHINGTON AVE. STG. 3 | TIMSVILLE, FL 32780 | PREVIOUS CONTAINERS

Phone # **321-269-5880** | E-mail **crepta@geosyntec.com** | NUMBER OF CONTAINERS

Sampler's Signature **DAVID S. REMORE** | Sampler's Printed Name **DAVID S. REMORE** | MATRIX

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	TIME	MATRIX	REMARKS/ ALTERNATE DESCRIPTION	PRESERVATIVE	TURNAROUND REQUIREMENTS	REPORT REQUIREMENTS	INVOICE INFORMATION
LC34-DPT0332-037.0	20110803-001	08/08/11	903	Soil		GCMS VOAS <input type="checkbox"/> CLP GCMS SVOAS <input type="checkbox"/> 8260 <input type="checkbox"/> 624 GC VOAS <input type="checkbox"/> 8270 <input type="checkbox"/> 625 PESTICIDES <input type="checkbox"/> 8021 <input type="checkbox"/> 601/602 <input type="checkbox"/> 8081 <input type="checkbox"/> 608 PCBS <input type="checkbox"/> 8082 <input type="checkbox"/> 608 METALS, TOTAL (List in comments below)	<input type="checkbox"/> RUSH (SURCHARGES APPLY) <input type="checkbox"/> 1 day <input type="checkbox"/> 2 day <input type="checkbox"/> 3 day <input type="checkbox"/> 4 day <input type="checkbox"/> 5 day <input checked="" type="checkbox"/> Standard	<input type="checkbox"/> I. Results Only <input type="checkbox"/> II. Results + CC Summaries (LCS, DUP, MS/MSD as required) <input checked="" type="checkbox"/> III. Results + QC and Calibration Summaries <input type="checkbox"/> IV. Data Validation Report with Edata <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	PO #: BILL TO:
LC34-DPT0332-043.5	20110803-002		921		8260 C (VOCT HBA)				
LC34-DPT0332-045.0	20110803-003		947						
LC34-DPT0332-048.0	20110803-004		956						
LC34-DPT0332-053.0	20110803-005		1013						
LC34-DPT0333-037.0	20110803-006		1114						
LC34-DPT0333-044.0	20110803-007		1128						
LC34-DPT0333-045.5	20110803-008		1150						
LC34-DPT0333-047.0	20110803-009		1155						
LC34-DPT0333-048.5	20110803-010		1157						



See QAPP

SPECIAL INSTRUCTIONS/COMMENTS: **Metals**

RELINQUISHED BY	RECEIVED BY
Signature: Joseph Bartlett Printed Name: JOSEPH BARTLETT Firm: GEOSYNTEC Date/Time: 08/08/11 1030	Signature: Corey Repta Printed Name: Corey Repta Firm: CSA Date/Time: 8/5/11 0939

Project Name: **LC34**
 Project Manager: **COAY REETA**
 Company/Address: **GEOSYNTEC**
 6770 S. WASHINGTON AVE. STE. 3
 TITUSVILLE FL 32780
 Phone #: **321-269-5880**
 E-mail: **crepta@geosyntec.com**
 Sample's Signature: **[Signature]**
 Sample's Printed Name: **DAVID SILLMOR**

Project Number: **120272**
 Report CC: **←**

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	PRESERVATIVE	REMARKS/ALTERNATE DESCRIPTION
LC34-DPT0332-053.0	20110803	11/12/27	1227	Sol.			
LC34-DPT0334-034.5	20110803	1404	1404				
LC34-DPT334-037.0	20110803	1413	1413				
LC34-DPT334-045.5	20110803	1457	1457				
LC34-DPT334-047.0	20110803	1507	1507				
LC34-DPT334-048.5	20110803	1513	1513				
LC34-DPT334-053.0	20110803	1522	1522	Water			
LC34-DPT-IDW183866	20110803	1600	1600				
LC34-IDW183865	20110803	NA	NA				
LC34-1B-20110803	NA	NA	NA				

Preservative Key:
 0. NONE
 1. HCL
 2. HNO3
 3. H2SO4
 4. NaOH
 5. Zn. Acetate
 6. MeOH
 7. NaHSO4
 8. Other **LC2**

Special Instructions/Comments: **Metals**

TURNAROUND REQUIREMENTS: **RUSH (SURCHARGES APPLY)**
 1 day 2 day 3 day
 4 day 5 day
 Standard

REPORT REQUIREMENTS:
 I. Results Only
 II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
 III. Results + QC and Calibration Summaries
 IV. Data Validation Report with Flow Data

INVOICE INFORMATION:
 PO #: **R1104287**
 BILL TO: **See R1104287**

RECEIVED BY: **[Signature]**
 Signature: **[Signature]**
 Printed Name: **[Name]**
 Firm: **[Firm]**
 Date/Time: **[Date/Time]**

RECEIVED BY: **[Signature]**
 Signature: **[Signature]**
 Printed Name: **[Name]**
 Firm: **[Firm]**
 Date/Time: **[Date/Time]**

RELINQUISHED BY: **[Signature]**
 Signature: **[Signature]**
 Printed Name: **[Name]**
 Firm: **[Firm]**
 Date/Time: **[Date/Time]**

RELINQUISHED BY: **[Signature]**
 Signature: **[Signature]**
 Printed Name: **[Name]**
 Firm: **[Firm]**
 Date/Time: **[Date/Time]**

Requested Report Date: **8/5/11 0939**

Edata Yes No

PO #: **R1104376**

Cooler Receipt And Preservation Check Form

Project/Client Sensyntec Folder Number R11-4576

Cooler received on 8/5/11 by: RD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A 7dw 183866 (1 vial)
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.1°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/5/11 0948

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 8/9/11

Cooler Breakdown: Date: 8/8/11 Time: 1031 by: dfw

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis -- pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: _____
 Other Comments: _____

PC Secondary Review: KB 8/10/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

September 06, 2011

Service Request No: R1104535

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272 8/12/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 13, 2011. For your reference, these analyses have been assigned our service request number **R1104535**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 43

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1104535
Date Received: 8/12/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Three (3) water samples including one (1) Trip Blank were collected by the client on 8/12/11 and were received for analysis at Columbia Analytical Services on 8/13/11 via a national courier. The samples were received at a cooler temperature of 5.3°C within the guidelines of 0-6°C.

Organic Compounds

Three (3) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) water samples were also analyzed for GC Method RSK-175 and Organic Acids by HPLC.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except the Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Dichlorodifluoromethane (-21.7%) on the 8/16/11 analytical run and MEK (-20.6%), Carbon Tetrachloride (-20.2%), and Dichlorodifluoromethane (-20.6%) on the 8/17/11 run. All detected concentrations for these compounds in samples associated with these CCV's should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. Laboratory Control Samples (LCS) and LCS Duplicate recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples had hits above the calibration range of the standards and required multiple dilutions. The samples were repeated at the appropriate dilution for the above range hits. Subsequent hits from the dilutions are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All samples were initially analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

The Laboratory Method Blanks were free from contamination.

The Primary Standard mix for RSK expired on 8/6/11. The Secondary Standard mix expired on 8/9/11. Both standards have shown little to no degradation over the past year. New standards have been ordered but not yet received.

No other analytical or QC problems were encountered.

Approved by



Date

8/17/11

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, and TOC by 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F, Dissolved metals by ICP 6010C, and Anions: Chloride and Sulfate by IC method 300.0 and Nitrate and Nitrite by method 353.2. The Nitrate and Nitrite were analyzed by this alternative method in order to meet the appropriate holding time for the analyses which were received on a weekend. The client was notified in the receipt acknowledgment for the samples. The Dissolved metals were filtered in the laboratory.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within QC acceptance limits.

All holding times were met for these analyses.

All Laboratory Method Blanks were free from contamination except for Dissolved Iron and Manganese. Affected data is flagged as "B" for these compounds.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104535

<u>Lab ID</u>	<u>Client ID</u>
R1104535-001	LC34-RW0007-038.5-20110812
R1104535-002	LC34-RW0008-052.0-20110812
R1104535-003	LC34-TB-20110812
R1104535-004	LC34-RW0007-038.5-20110812 Diss.
R1104535-005	LC34-RW0008-052.0-20110812 Diss.

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the “Notes” column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an “immediate” hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory’s NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110812
Lab Code: R1104535-001

Service Request: R1104535
Date Collected: 8/12/11 1126
Date Received: 8/13/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	460		mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	11.8		mg/L	1.0	10	NA	8/15/11 21:09	
Carbon, Total Organic (TOC), Average	9060A	191		mg/L	20	20	NA	8/29/11 22:08	
Chloride	300.0	264		mg/L	10	50	NA	8/16/11 17:32	
Iodide	300.0	15.2		mg/L	2.0	10	NA	8/16/11 16:36	
Nitrate as Nitrogen	Calculation	0.05	U	mg/L	0.05	1	NA		
Nitrate+Nitrite as Nitrogen	353.2	0.050	U	mg/L	0.050	1	NA	8/19/11 12:02	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	8/13/11 12:23	
Sulfate	300.0	17.8		mg/L	2.0	10	NA	8/15/11 21:09	
Sulfide, Total	SM 4500-S2- F	9.2		mg/L	1.0	1	NA	8/17/11 09:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110812 Diss.
Lab Code: R1104535-005

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/17/11	8/18/11 15:50	
Iron, Dissolved	6010C	180 B	µg/L	100	1	8/17/11	8/18/11 15:50	
Manganese, Dissolved	6010C	23 B	µg/L	10	1	8/17/11	8/18/11 15:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110812
 Lab Code: R1104535-001

Service Request: R1104535
 Date Collected: 8/12/11 1126
 Date Received: 8/13/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,1,2,2-Tetrachloroethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,1,2-Trichloroethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,1,2-Trichloro-1,2,2-trifluoroethane	16000		1300	250	NA	8/16/11 19:12		257650	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2,4-Trichlorobenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2-Dibromoethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2-Dichlorobenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2-Dichloroethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,2-Dichloropropane	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,3-Dichlorobenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
1,4-Dichlorobenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
n-Butanol	230000		63000	250	NA	8/16/11 19:12		257650	
2-Butanone (MEK)	2500	U	2500	250	NA	8/16/11 19:12		257650	
2-Hexanone	2500	U	2500	250	NA	8/16/11 19:12		257650	
4-Methyl-2-pentanone	2500	U	2500	250	NA	8/16/11 19:12		257650	
Acetone	5000	U	5000	250	NA	8/16/11 19:12		257650	
Benzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
Bromodichloromethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Bromoform	1300	U	1300	250	NA	8/16/11 19:12		257650	
Bromomethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Carbon Disulfide	2500	U	2500	250	NA	8/16/11 19:12		257650	
Carbon Tetrachloride	1300	U	1300	250	NA	8/16/11 19:12		257650	
Chlorobenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
Chloroethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Chloroform	1300	U	1300	250	NA	8/16/11 19:12		257650	
Chloromethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Cyclohexane	2500	U	2500	250	NA	8/16/11 19:12		257650	
Dibromochloromethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	250	NA	8/16/11 19:12		257650	
Dichloromethane	1300	U	1300	250	NA	8/16/11 19:12		257650	
Ethylbenzene	1300	U	1300	250	NA	8/16/11 19:12		257650	
Isopropylbenzene (Cumene)	1300	U	1300	250	NA	8/16/11 19:12		257650	
Methyl Acetate	2500	U	2500	250	NA	8/16/11 19:12		257650	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110812
Lab Code: R1104535-001

Service Request: R1104535
Date Collected: 8/12/11 1126
Date Received: 8/13/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	250	NA	8/16/11 19:12		257650	
Methylcyclohexane	2500	U	2500	250	NA	8/16/11 19:12		257650	
Styrene	1300	U	1300	250	NA	8/16/11 19:12		257650	
Tetrachloroethene (PCE)	1300	U	1300	250	NA	8/16/11 19:12		257650	
Toluene	1300	U	1300	250	NA	8/16/11 19:12		257650	
Trichloroethene (TCE)	3300		1300	250	NA	8/16/11 19:12		257650	
Trichlorofluoromethane (CFC 11)	1300	U	1300	250	NA	8/16/11 19:12		257650	
Vinyl Chloride	1300	U	1300	250	NA	8/16/11 19:12		257650	
cis-1,2-Dichloroethene	26000		1300	250	NA	8/16/11 19:12		257650	
cis-1,3-Dichloropropene	1300	U	1300	250	NA	8/16/11 19:12		257650	
m,p-Xylenes	1300	U	1300	250	NA	8/16/11 19:12		257650	
n-Butyl Acetate	33000		1300	250	NA	8/16/11 19:12		257650	
o-Xylene	1300	U	1300	250	NA	8/16/11 19:12		257650	
trans-1,2-Dichloroethene	1300	U	1300	250	NA	8/16/11 19:12		257650	
trans-1,3-Dichloropropene	1300	U	1300	250	NA	8/16/11 19:12		257650	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	8/16/11 19:12	
Dibromofluoromethane	103	89-119	8/16/11 19:12	
Toluene-d8	103	87-121	8/16/11 19:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110812
 Lab Code: R1104535-001

Service Request: R1104535
 Date Collected: 8/12/11 1126
 Date Received: 8/13/11

Units: µg/L
 Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	55		1.0	1	NA	8/17/11 12:18		257822	
Ethene	14		1.0	1	NA	8/17/11 12:18		257822	
Methane	93		2.0	1	NA	8/17/11 12:18		257822	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Collected: 8/12/11 1126
Date Received: 8/13/11
Date Analyzed: 8/24/11 05:06

Sample Name: LC34-RW0007-038.5-20110812
Lab Code: R1104535-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082311\X0006237.D\

Analysis Lot: 258678
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	260	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	68	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.0 U	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110812
Lab Code: R1104535-002

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	378		mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	17.3		mg/L	1.0	10	NA	8/15/11 21:23	
Carbon, Total Organic (TOC), Average	9060A	203		mg/L	30	30	NA	8/29/11 22:47	
Chloride	300.0	594		mg/L	20	100	NA	8/16/11 19:09	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	8/16/11 16:45	
Nitrate as Nitrogen	Calculation	0.05	U	mg/L	0.05	1	NA		
Nitrate+Nitrite as Nitrogen	353.2	0.050	U	mg/L	0.050	1	NA	8/19/11 12:03	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	8/13/11 12:23	
Sulfate	300.0	23.1		mg/L	2.0	10	NA	8/15/11 21:23	
Sulfide, Total	SM 4500-S2- F	10.4		mg/L	0.98	1	NA	8/17/11 09:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110812 Diss.
Lab Code: R1104535-004

Service Request: R1104535
Date Collected: 8/12/11 1126
Date Received: 8/13/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/17/11	8/18/11 15:34	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/17/11	8/18/11 15:34	
Manganese, Dissolved	6010C	12 B	µg/L	10	1	8/17/11	8/18/11 15:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110812
Lab Code: R1104535-002

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	100	U	100	20	NA	8/16/11 19:40		257650	
1,1,2,2-Tetrachloroethane	100	U	100	20	NA	8/16/11 19:40		257650	
1,1,2-Trichloroethane	100	U	100	20	NA	8/16/11 19:40		257650	
1,1,2-Trichloro-1,2,2-trifluoroethane	710		100	20	NA	8/16/11 19:40		257650	
1,1-Dichloroethane (1,1-DCA)	100	U	100	20	NA	8/16/11 19:40		257650	
1,1-Dichloroethene (1,1-DCE)	100	U	100	20	NA	8/16/11 19:40		257650	
1,2,4-Trichlorobenzene	100	U	100	20	NA	8/16/11 19:40		257650	
1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	20	NA	8/16/11 19:40		257650	
1,2-Dibromoethane	100	U	100	20	NA	8/16/11 19:40		257650	
1,2-Dichlorobenzene	100	U	100	20	NA	8/16/11 19:40		257650	
1,2-Dichloroethane	100	U	100	20	NA	8/16/11 19:40		257650	
1,2-Dichloropropane	100	U	100	20	NA	8/16/11 19:40		257650	
1,3-Dichlorobenzene	100	U	100	20	NA	8/16/11 19:40		257650	
1,4-Dichlorobenzene	100	U	100	20	NA	8/16/11 19:40		257650	
n-Butanol	120000		5000	20	NA	8/16/11 19:40		257650	
2-Butanone (MEK)	200	U	200	20	NA	8/16/11 19:40		257650	
2-Hexanone	200	U	200	20	NA	8/16/11 19:40		257650	
4-Methyl-2-pentanone	200	U	200	20	NA	8/16/11 19:40		257650	
Acetone	400	U	400	20	NA	8/16/11 19:40		257650	
Benzene	100	U	100	20	NA	8/16/11 19:40		257650	
Bromodichloromethane	100	U	100	20	NA	8/16/11 19:40		257650	
Bromoform	100	U	100	20	NA	8/16/11 19:40		257650	
Bromomethane	100	U	100	20	NA	8/16/11 19:40		257650	
Carbon Disulfide	200	U	200	20	NA	8/16/11 19:40		257650	
Carbon Tetrachloride	100	U	100	20	NA	8/16/11 19:40		257650	
Chlorobenzene	100	U	100	20	NA	8/16/11 19:40		257650	
Chloroethane	100	U	100	20	NA	8/16/11 19:40		257650	
Chloroform	100	U	100	20	NA	8/16/11 19:40		257650	
Chloromethane	100	U	100	20	NA	8/16/11 19:40		257650	
Cyclohexane	200	U	200	20	NA	8/16/11 19:40		257650	
Dibromochloromethane	100	U	100	20	NA	8/16/11 19:40		257650	
Dichlorodifluoromethane (CFC 12)	100	U	100	20	NA	8/16/11 19:40		257650	
Dichloromethane	100	U	100	20	NA	8/16/11 19:40		257650	
Ethylbenzene	100	U	100	20	NA	8/16/11 19:40		257650	
Isopropylbenzene (Cumene)	100	U	100	20	NA	8/16/11 19:40		257650	
Methyl Acetate	200	U	200	20	NA	8/16/11 19:40		257650	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110812
Lab Code: R1104535-002

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	100	U	100	20	NA	8/16/11 19:40		257650	
Methylcyclohexane	200	U	200	20	NA	8/16/11 19:40		257650	
Styrene	100	U	100	20	NA	8/16/11 19:40		257650	
Tetrachloroethene (PCE)	100	U	100	20	NA	8/16/11 19:40		257650	
Toluene	100	U	100	20	NA	8/16/11 19:40		257650	
Trichloroethene (TCE)	1900		100	20	NA	8/16/11 19:40		257650	
Trichlorofluoromethane (CFC 11)	100	U	100	20	NA	8/16/11 19:40		257650	
Vinyl Chloride	100	U	100	20	NA	8/16/11 19:40		257650	
cis-1,2-Dichloroethene	1700		100	20	NA	8/16/11 19:40		257650	
cis-1,3-Dichloropropene	100	U	100	20	NA	8/16/11 19:40		257650	
m,p-Xylenes	100	U	100	20	NA	8/16/11 19:40		257650	
n-Butyl Acetate	8100	D	250	50	NA	8/17/11 14:18		257802	
o-Xylene	100	U	100	20	NA	8/16/11 19:40		257650	
trans-1,2-Dichloroethene	100	U	100	20	NA	8/16/11 19:40		257650	
trans-1,3-Dichloropropene	100	U	100	20	NA	8/16/11 19:40		257650	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/16/11 19:40	
Dibromofluoromethane	99	89-119	8/16/11 19:40	
Toluene-d8	103	87-121	8/16/11 19:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110812
Lab Code: R1104535-002

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	7.8		1.0	1	NA	8/17/11 12:29		257822	
Ethene	2.0		1.0	1	NA	8/17/11 12:29		257822	
Methane	120	D	4.0	2	NA	8/17/11 12:49		257822	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Collected: 8/12/11 1048
Date Received: 8/13/11
Date Analyzed: 8/24/11 20:38

Sample Name: LC34-RW0008-052.0-20110812
Lab Code: R1104535-002

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082411\X0006250.D\

Analysis Lot: 258921
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	220	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	150	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	5.5	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water
 Sample Name: LC34-TB-20110812
 Lab Code: R1104535-003

Service Request: R1104535
 Date Collected: 8/12/11
 Date Received: 8/13/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
n-Butanol	250	U	250	1	NA	8/16/11 18:44		257650	
2-Butanone (MEK)	10	U	10	1	NA	8/16/11 18:44		257650	
2-Hexanone	10	U	10	1	NA	8/16/11 18:44		257650	
4-Methyl-2-pentanone	10	U	10	1	NA	8/16/11 18:44		257650	
Acetone	20	U	20	1	NA	8/16/11 18:44		257650	
Benzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Bromodichloromethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Bromoform	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Bromomethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Carbon Disulfide	10	U	10	1	NA	8/16/11 18:44		257650	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Chlorobenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Chloroethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Chloroform	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Chloromethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Cyclohexane	10	U	10	1	NA	8/16/11 18:44		257650	
Dibromochloromethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Dichloromethane	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Ethylbenzene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Methyl Acetate	10	U	10	1	NA	8/16/11 18:44		257650	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: LC34-TB-20110812
Lab Code: R1104535-003

Service Request: R1104535
Date Collected: 8/12/11
Date Received: 8/13/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Methylcyclohexane	10	U	10	1	NA	8/16/11 18:44		257650	
Styrene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Toluene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
Vinyl Chloride	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
m,p-Xylenes	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
o-Xylene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/16/11 18:44		257650	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	8/16/11 18:44	
Dibromofluoromethane	99	89-119	8/16/11 18:44	
Toluene-d8	104	87-121	8/16/11 18:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104535-MB1

Service Request: R1104535
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/16/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/15/11 20:41	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/29/11 17:29	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 11:03	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	8/16/11 14:37	
Nitrate+Nitrite as Nitrogen	353.2	0.050	U	mg/L	0.050	1	NA	8/19/11 11:52	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	8/13/11 12:23	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/15/11 20:41	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	8/17/11 09:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: R1104535-MB1

Service Request: R1104535
 Date Collected: NA
 Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	8/17/11	8/18/11 14:42	
Iron, Dissolved	6010C	100 U	µg/L	100	1	8/17/11	8/18/11 14:42	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	8/17/11	8/18/11 14:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104535-MB2

Service Request: R1104535
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	0.20 U	mg/L	0.20	1	NA	8/16/11 18:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104535-MB2

Service Request: R1104535
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/17/11	8/18/11 14:54	
Iron, Dissolved	6010C	1000		µg/L	100	1	8/17/11	8/18/11 14:54	
Manganese, Dissolved	6010C	10		µg/L	10	1	8/17/11	8/18/11 14:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1107941-03

Service Request: R1104535
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
n-Butanol	250	U	250	1	NA	8/16/11 12:12		257650	
2-Butanone (MEK)	10	U	10	1	NA	8/16/11 12:12		257650	
2-Hexanone	10	U	10	1	NA	8/16/11 12:12		257650	
4-Methyl-2-pentanone	10	U	10	1	NA	8/16/11 12:12		257650	
Acetone	20	U	20	1	NA	8/16/11 12:12		257650	
Benzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Bromodichloromethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Bromoform	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Bromomethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Carbon Disulfide	10	U	10	1	NA	8/16/11 12:12		257650	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Chlorobenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Chloroethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Chloroform	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Chloromethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Cyclohexane	10	U	10	1	NA	8/16/11 12:12		257650	
Dibromochloromethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Dichloromethane	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Ethylbenzene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Methyl Acetate	10	U	10	1	NA	8/16/11 12:12		257650	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1107941-03

Service Request: R1104535
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Methylcyclohexane	10	U	10	1	NA	8/16/11 12:12		257650	
Styrene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Toluene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
Vinyl Chloride	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
m,p-Xylenes	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
o-Xylene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/16/11 12:12		257650	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	8/16/11 12:12	
Dibromofluoromethane	104	89-119	8/16/11 12:12	
Toluene-d8	105	87-121	8/16/11 12:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108002-03

Service Request: R1104535
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
n-Butanol	250	U	250	1	NA	8/17/11 13:21		257802	
2-Butanone (MEK)	10	U	10	1	NA	8/17/11 13:21		257802	
2-Hexanone	10	U	10	1	NA	8/17/11 13:21		257802	
4-Methyl-2-pentanone	10	U	10	1	NA	8/17/11 13:21		257802	
Acetone	20	U	20	1	NA	8/17/11 13:21		257802	
Benzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Bromodichloromethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Bromoform	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Bromomethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Carbon Disulfide	10	U	10	1	NA	8/17/11 13:21		257802	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Chlorobenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Chloroethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Chloroform	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Chloromethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Cyclohexane	10	U	10	1	NA	8/17/11 13:21		257802	
Dibromochloromethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Dichloromethane	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Ethylbenzene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Methyl Acetate	10	U	10	1	NA	8/17/11 13:21		257802	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108002-03

Service Request: R1104535
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Methylcyclohexane	10	U	10	1	NA	8/17/11 13:21		257802	
Styrene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Toluene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
Vinyl Chloride	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
m,p-Xylenes	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
o-Xylene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/17/11 13:21		257802	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	8/17/11 13:21	
Dibromofluoromethane	104	89-119	8/17/11 13:21	
Toluene-d8	105	87-121	8/17/11 13:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108007-01

Service Request: R1104535
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	8/17/11 10:06		257822	
Ethene	1.0	U	1.0	1	NA	8/17/11 10:06		257822	
Methane	2.0	U	2.0	1	NA	8/17/11 10:06		257822	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Collected: NA
Date Received: NA
Date Analyzed: 8/23/11 13:53

Sample Name: Method Blank
Lab Code: RQ1108248-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082311\X0006222.D\

Analysis Lot: 258678
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Collected: NA
Date Received: NA
Date Analyzed: 8/24/11 17:33

Sample Name: Method Blank
Lab Code: RQ1108345-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\082411\X0006247.D\

Analysis Lot: 258921
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/17/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104535-LCS1			Duplicate Lab Control Sample R1104535-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.76	6.6	103	6.77	6.6	103	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/13/11 - 8/29/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Lab Control Sample
 R1104535-LCS2

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Carbon, Total Organic (TOC)	9060A	10.2	10.0	102	86 - 117
Carbon, Total Organic (TOC)	9060A	9.72	10.0	97	86 - 117
Carbon, Total Organic (TOC)	9060A	10.1	10.0	101	86 - 117
Carbon, Total Organic (TOC)	9060A	10.4	10.0	104	86 - 117
Chloride	300.0	2.07	2.00	104	90 - 110
Iodide	300.0	1.02	1.00	102	90 - 110
Nitrate+Nitrite as Nitrogen	353.2	0.488	0.500	98	90 - 110
Nitrite as Nitrogen	353.2	0.242	0.250	97	90 - 110
Sulfate	300.0	1.98	2.00	99	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.1	20.0	101	72 - 115

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/16/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample		% Rec	% Rec Limits
		Result	Spike Amount		
Chloride	300.0	2.08	2.00	104	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/18/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1104535-LCS

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	6010C	37.4	40	94	80 - 120
Iron, Dissolved	6010C	987	1000	99	80 - 120
Manganese, Dissolved	6010C	500	500	100	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/12/11
 Sample Matrix: Water

Service Request: R1104535
 Date Analyzed: 8/16/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 257650

Lab Control Sample
 RQ1107941-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.4	20.0	102	72 - 128
1,1,2,2-Tetrachloroethane	20.3	20.0	102	72 - 131
1,1,2-Trichloroethane	19.1	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.5	20.0	102	68 - 136
1,1-Dichloroethane (1,1-DCA)	22.0	20.0	110	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.8	20.0	99	72 - 129
1,2,4-Trichlorobenzene	19.0	20.0	95	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.5	20.0	98	62 - 131
1,2-Dibromoethane	20.1	20.0	101	78 - 125
1,2-Dichlorobenzene	20.6	20.0	103	79 - 124
1,2-Dichloroethane	19.6	20.0	98	73 - 127
1,2-Dichloropropane	20.1	20.0	101	80 - 123
1,3-Dichlorobenzene	20.6	20.0	103	78 - 124
1,4-Dichlorobenzene	19.9	20.0	99	78 - 123
n-Butanol	1140	1000	114	70 - 130
2-Butanone (MEK)	20.6	20.0	103	60 - 133
2-Hexanone	19.2	20.0	96	61 - 131
4-Methyl-2-pentanone	18.5	20.0	93	61 - 132
Acetone	20.3	20.0	102	54 - 139
Benzene	20.0	20.0	100	78 - 121
Bromodichloromethane	20.7	20.0	103	80 - 125
Bromoform	19.9	20.0	99	68 - 130
Bromomethane	22.7	20.0	114	57 - 144
Carbon Disulfide	21.7	20.0	109	52 - 140
Carbon Tetrachloride	18.6	20.0	93	68 - 133
Chlorobenzene	19.8	20.0	99	80 - 121
Chloroethane	20.6	20.0	103	71 - 130
Chloroform	21.3	20.0	107	78 - 125
Chloromethane	25.8	20.0	129	61 - 138
Cyclohexane	18.0	20.0	90	57 - 126
Dibromochloromethane	19.4	20.0	97	78 - 133
Dichlorodifluoromethane (CFC 12)	24.4	20.0	122	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/16/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 257650

**Lab Control Sample
 RQ1107941-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.8	20.0	99	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	21.9	20.0	109	73 - 133
Methyl Acetate	21.0	20.0	105	57 - 157
Methyl tert-Butyl Ether	21.1	20.0	106	75 - 126
Methylcyclohexane	18.0	20.0	90	61 - 125
Styrene	20.0	20.0	100	80 - 132
Tetrachloroethene (PCE)	18.7	20.0	93	72 - 131
Toluene	19.8	20.0	99	78 - 122
Trichloroethene (TCE)	20.5	20.0	102	74 - 127
Trichlorofluoromethane (CFC 11)	21.9	20.0	110	69 - 141
Vinyl Chloride	25.0	20.0	125	72 - 138
cis-1,2-Dichloroethene	21.1	20.0	105	78 - 122
cis-1,3-Dichloropropene	19.9	20.0	100	77 - 125
m,p-Xylenes	41.0	40.0	102	79 - 126
n-Butyl Acetate	19.3	20.0	97	31 - 144
o-Xylene	20.0	20.0	100	77 - 118
trans-1,2-Dichloroethene	20.4	20.0	102	75 - 121
trans-1,3-Dichloropropene	19.2	20.0	96	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/17/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 257802

Analyte Name	Lab Control Sample RQ1108002-04			Duplicate Lab Control Sample RQ1108002-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	18.6	20.0	93	18.3	20.0	92	72 - 128	2	30
1,1,2,2-Tetrachloroethane	18.3	20.0	91	19.2	20.0	96	72 - 131	5	30
1,1,2-Trichloroethane	18.5	20.0	93	18.4	20.0	92	80 - 122	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	17.9	20.0	89	17.6	20.0	88	68 - 136	2	30
1,1-Dichloroethane (1,1-DCA)	20.4	20.0	102	20.0	20.0	100	76 - 124	2	30
1,1-Dichloroethene (1,1-DCE)	18.1	20.0	90	17.9	20.0	90	72 - 129	<1	30
1,2,4-Trichlorobenzene	18.2	20.0	91	18.2	20.0	91	70 - 133	<1	30
1,2-Dibromo-3-chloropropane (DBCP)	17.0	20.0	85	18.8	20.0	94	62 - 131	10	30
1,2-Dibromoethane	18.2	20.0	91	18.7	20.0	94	78 - 125	2	30
1,2-Dichlorobenzene	18.9	20.0	94	19.1	20.0	96	79 - 124	1	30
1,2-Dichloroethane	18.4	20.0	92	18.8	20.0	94	73 - 127	2	30
1,2-Dichloropropane	19.6	20.0	98	19.5	20.0	97	80 - 123	<1	30
1,3-Dichlorobenzene	19.8	20.0	99	19.2	20.0	96	78 - 124	3	30
1,4-Dichlorobenzene	19.6	20.0	98	19.0	20.0	95	78 - 123	3	30
n-Butanol	975	1000	97	874	1000	87	70 - 130	11	30
2-Butanone (MEK)	17.5	20.0	88	17.7	20.0	88	60 - 133	<1	30
2-Hexanone	18.0	20.0	90	17.3	20.0	86	61 - 131	4	30
4-Methyl-2-pentanone	17.6	20.0	88	18.0	20.0	90	61 - 132	3	30
Acetone	17.7	20.0	89	17.5	20.0	88	54 - 139	1	30
Benzene	18.8	20.0	94	18.9	20.0	94	78 - 121	<1	30
Bromodichloromethane	19.3	20.0	97	19.2	20.0	96	80 - 125	<1	30
Bromoform	19.1	20.0	95	18.9	20.0	95	68 - 130	<1	30
Bromomethane	21.0	20.0	105	20.1	20.0	101	57 - 144	4	30
Carbon Disulfide	21.0	20.0	105	19.5	20.0	97	52 - 140	8	30
Carbon Tetrachloride	17.5	20.0	87	17.5	20.0	87	68 - 133	<1	30
Chlorobenzene	18.4	20.0	92	18.6	20.0	93	80 - 121	1	30
Chloroethane	19.2	20.0	96	19.3	20.0	96	71 - 130	<1	30
Chloroform	20.5	20.0	103	19.8	20.0	99	78 - 125	4	30
Chloromethane	25.5	20.0	127	25.0	20.0	125	61 - 138	2	30
Cyclohexane	18.3	20.0	91	18.3	20.0	91	57 - 126	<1	30
Dibromochloromethane	18.1	20.0	90	17.9	20.0	89	78 - 133	1	30
Dichlorodifluoromethane (CFC 12)	22.7	20.0	113	21.3	20.0	107	45 - 159	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/17/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 257802

Analyte Name	Lab Control Sample RQ1108002-04			Duplicate Lab Control Sample RQ1108002-05			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	18.9	20.0	94	18.4	20.0	92	75 - 125	2	30
Ethylbenzene	19.3	20.0	96	19.3	20.0	96	78 - 123	<1	30
Isopropylbenzene (Cumene)	20.8	20.0	104	21.0	20.0	105	73 - 133	<1	30
Methyl Acetate	18.6	20.0	93	19.3	20.0	96	57 - 157	4	30
Methyl tert-Butyl Ether	18.6	20.0	93	19.0	20.0	95	75 - 126	2	30
Methylcyclohexane	18.1	20.0	90	18.2	20.0	91	61 - 125	<1	30
Styrene	19.2	20.0	96	18.8	20.0	94	80 - 132	2	30
Tetrachloroethene (PCE)	18.4	20.0	92	18.0	20.0	90	72 - 131	2	30
Toluene	18.8	20.0	94	18.7	20.0	93	78 - 122	<1	30
Trichloroethene (TCE)	19.1	20.0	96	19.0	20.0	95	74 - 127	<1	30
Trichlorofluoromethane (CFC 11)	20.0	20.0	100	19.8	20.0	99	69 - 141	1	30
Vinyl Chloride	23.8	20.0	119	23.1	20.0	116	72 - 138	3	30
cis-1,2-Dichloroethene	20.0	20.0	100	18.8	20.0	94	78 - 122	6	30
cis-1,3-Dichloropropene	18.2	20.0	91	18.5	20.0	93	77 - 125	2	30
m,p-Xylenes	39.4	40.0	98	39.3	40.0	98	79 - 126	<1	30
n-Butyl Acetate	18.1	20.0	91	18.6	20.0	93	31 - 144	3	30
o-Xylene	18.8	20.0	94	19.0	20.0	95	77 - 118	1	30
trans-1,2-Dichloroethene	19.2	20.0	96	19.0	20.0	95	75 - 121	<1	30
trans-1,3-Dichloropropene	17.3	20.0	86	17.3	20.0	87	69 - 127	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/17/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 257822

Analyte Name	Lab Control Sample RQ1108007-02			Duplicate Lab Control Sample RQ1108007-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.0	26.4	99	24.7	26.4	94	56 - 148	5	30
Ethene	22.8	24.6	93	21.8	24.6	89	58 - 155	5	30
Methane	26.0	26.5	98	24.8	26.5	93	55 - 150	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/23/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 258678

Analyte Name	Lab Control Sample RQ1108248-02			Duplicate Lab Control Sample RQ1108248-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.10	1.00	110	1.13	1.00	113	70 - 130	3	30
Acetic Acid	9.75	10.0	98	9.78	10.0	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.1	10.0	101	9.71	10.0	97	78 - 113	4	30
Lactic Acid	9.23	9.97	93	9.25	9.97	93	61 - 109	<1	30
Propionic Acid	9.20	9.97	92	9.64	9.97	97	80 - 125	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/12/11
Sample Matrix: Water

Service Request: R1104535
Date Analyzed: 8/24/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 258921

Analyte Name	Lab Control Sample RQ1108345-02			Duplicate Lab Control Sample RQ1108345-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.18	1.00	118	1.14	1.00	114	70 - 130	3	30
Acetic Acid	9.79	10.0	98	9.67	10.0	97	70 - 135	1	30
Butanoic Acid (Butyric Acid)	10.5	10.0	105	9.76	10.0	98	78 - 113	7	30
Lactic Acid	9.37	9.97	94	9.34	9.97	94	61 - 109	<1	30
Propionic Acid	9.59	9.97	96	9.42	9.97	95	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PEDLC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2, Phone: 519-822-2230
 City, State, Zip: Coeleph, ON, N1G 5G3 FAX:
 Sampler's Signature: *[Signature]*

Sample ID	Date	Time	LAB ID	Matrix
LC34-RW007-038.5-20110812	08/12/11	11:24p	-001, 004	W
LC34-RW008-052.0-20110812	08/12/11	10:48p	-002, 005	W
LC34-TB-20110812	08/12/11	NA	-003	W

Number of Containers	Analysis Requested											REMARKS
	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)			
16	3	2	1	3	1	3	1	1	1	1		
16	3	2	1	3	1	3	1	1	1			
3	3											

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:
 Invoice Information
 P.O. #
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 Please filter dissolved metals in lab



RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: Joseph B. Bartlett
 Firm: Geosyntec Consultants
 Date/Time: 08/12/11 - 1630

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: FEDEx
 Firm:
 Date/Time:

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Christine M. Kuten
 Firm: CAS
 Date/Time: 8/13/11 0933

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R11-4535

Cooler received on 8/13/11 by: cnk COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 5.3°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/13/11 0936

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 8/16/11

Cooler Breakdown: Date: 8/15/11 Time: 0950 by: Aht

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			WC103051F	2/16				
≤2	HNO ₃								
≤2	H ₂ SO ₄	X		WC103081B	4/12				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-						
	Zn Aceta	-	-	WC103098C	5/12				
	HCl	*	*	4110060	7/12				

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust:

Bottle lot numbers: H₂PO₄ - WC1031046 exp 5/10
0-319-005, 1-087-002, 1-045-004, 053011-2V,
 Other Comments: 041111-20, 072511-2DD, 062711-2Z

PC Secondary Review: KB 9/16/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

September 12, 2011

Service Request No: R1104645

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 19, 2011. For your reference, these analyses have been assigned our service request number **R1104645**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1104645
Date Received: 8/19/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Three (3) water samples including one (1) Trip Blank were collected by the client on 8/18/11 and were received for analysis at Columbia Analytical Services on 8/19/11 via a national courier. The samples were received at a cooler temperature of 3.3°C within the guidelines of 0-6°C. Sulfide bottles as noted on the Cooler Receipt and Preservation Check Form at the end of the report did not indicate preservation on the bottle. Sodium Hydroxide pellets were visible in the bottles, however.

Organic Compounds

Three (3) water samples including one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C.

All surrogate recoveries were within acceptance limits.

Site specific QC is included in the report for locations LC34-RW0008-052.0-20110818 (CAS #R1104645-003) for 8260C. All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within limits except for Bromomethane (outside limits low) and Methyl Acetate (outside limits high). All Relative Percent Difference (RPD) calculations were acceptable. The Laboratory Control Samples (LCS) and LCS Duplicate (RSK & Organic Acids) recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

The Primary Standard mix for RSK expired on 8/6/11. The Secondary Standard mix expired on 8/9/11. Both standards have shown little to no degradation over the past year. New standards have been ordered but not yet received.

No other analytical or QC problems were encountered.

Approved by



Date



000002

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

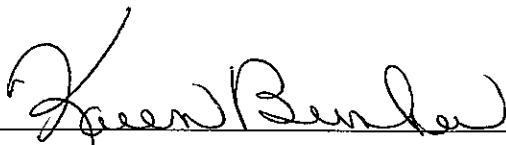
Site QC is included in the report for Bromide Sulfate and Nitrate for location LC34-RW0007-038.5-20110818 (CAS #R1104645-001) and LC34-RW0008-052.0-20110818 (CAS #R1104645-003) for TOC. All Matrix Spike (MS) recoveries were within QC acceptance limits except for Bromide and Sulfate. All Relative Percent Difference (RPD) calculations were acceptable. All Laboratory Control Sample (LCS) recoveries were within QC limits. Exceedences are flagged as “*”.

All holding times were met for these analyses for all analyses.

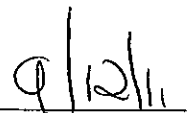
All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104645

<u>Lab ID</u>	<u>Client ID</u>
R1104645-001	LC34-RW0007-038.5-20110818
R1104645-002	LC34-RW0007-038.5-20110818 Dissolved
R1104645-003	LC34-RW0008-052.0-20110818
R1104645-004	LC34-RW0008-052.0-20110818 Dissolved
R1104645-005	LC34-TB-20110818

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110818
Lab Code: R1104645-001

Service Request: R1104645
Date Collected: 8/18/11 1018
Date Received: 8/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	510		mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	25.6		mg/L	1.0	10	NA	8/19/11 13:42	
Carbon, Total Organic (TOC), Average	9060A	363		mg/L	50	50	NA	8/29/11 19:28	
Chloride	300.0	421		mg/L	20	100	NA	8/19/11 14:37	
Iodide	300.0	16.8		mg/L	2.0	10	NA	9/1/11 14:03	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	8/19/11 13:42	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	8/19/11 14:37	
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	8/19/11 13:42	
Sulfide, Total	SM 4500-S2- F	14.7		mg/L	0.98	1	NA	8/22/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110818 Dissolved
Lab Code: R1104645-002

Service Request: R1104645
Date Collected: 8/18/11 1018
Date Received: 8/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	9/8/11 13:47	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/24/11	9/8/11 13:47	
Manganese, Dissolved	6010C	19		µg/L	10	1	8/24/11	8/31/11 02:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110818
 Lab Code: R1104645-001

Service Request: R1104645
 Date Collected: 8/18/11 1018
 Date Received: 8/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,1,2,2-Tetrachloroethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,1,2-Trichloroethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		1300	250	NA	8/23/11 19:10		258589	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2,4-Trichlorobenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2-Dibromoethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2-Dichlorobenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2-Dichloroethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,2-Dichloropropane	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,3-Dichlorobenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
1,4-Dichlorobenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
n-Butanol	130000		63000	250	NA	8/23/11 19:10		258589	
2-Butanone (MEK)	2500	U	2500	250	NA	8/23/11 19:10		258589	
2-Hexanone	2500	U	2500	250	NA	8/23/11 19:10		258589	
4-Methyl-2-pentanone	2500	U	2500	250	NA	8/23/11 19:10		258589	
Acetone	5000	U	5000	250	NA	8/23/11 19:10		258589	
Benzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
Bromodichloromethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Bromoform	1300	U	1300	250	NA	8/23/11 19:10		258589	
Bromomethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Carbon Disulfide	2500	U	2500	250	NA	8/23/11 19:10		258589	
Carbon Tetrachloride	1300	U	1300	250	NA	8/23/11 19:10		258589	
Chlorobenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
Chloroethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Chloroform	1300	U	1300	250	NA	8/23/11 19:10		258589	
Chloromethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Cyclohexane	2500	U	2500	250	NA	8/23/11 19:10		258589	
Dibromochloromethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	250	NA	8/23/11 19:10		258589	
Dichloromethane	1300	U	1300	250	NA	8/23/11 19:10		258589	
Ethylbenzene	1300	U	1300	250	NA	8/23/11 19:10		258589	
Isopropylbenzene (Cumene)	1300	U	1300	250	NA	8/23/11 19:10		258589	
Methyl Acetate	2500	U	2500	250	NA	8/23/11 19:10		258589	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110818
 Lab Code: R1104645-001

Service Request: R1104645
 Date Collected: 8/18/11 1018
 Date Received: 8/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	250	NA	8/23/11 19:10		258589	
Methylcyclohexane	2500	U	2500	250	NA	8/23/11 19:10		258589	
Styrene	1300	U	1300	250	NA	8/23/11 19:10		258589	
Tetrachloroethene (PCE)	1300	U	1300	250	NA	8/23/11 19:10		258589	
Toluene	1300	U	1300	250	NA	8/23/11 19:10		258589	
Trichloroethene (TCE)	7100		1300	250	NA	8/23/11 19:10		258589	
Trichlorofluoromethane (CFC 11)	1300	U	1300	250	NA	8/23/11 19:10		258589	
Vinyl Chloride	1400		1300	250	NA	8/23/11 19:10		258589	
cis-1,2-Dichloroethene	23000		1300	250	NA	8/23/11 19:10		258589	
cis-1,3-Dichloropropene	1300	U	1300	250	NA	8/23/11 19:10		258589	
m,p-Xylenes	1300	U	1300	250	NA	8/23/11 19:10		258589	
n-Butyl Acetate	1300	U	1300	250	NA	8/23/11 19:10		258589	
o-Xylene	1300	U	1300	250	NA	8/23/11 19:10		258589	
trans-1,2-Dichloroethene	1300	U	1300	250	NA	8/23/11 19:10		258589	
trans-1,3-Dichloropropene	1300	U	1300	250	NA	8/23/11 19:10		258589	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	8/23/11 19:10	
Dibromofluoromethane	105	89-119	8/23/11 19:10	
Toluene-d8	104	87-121	8/23/11 19:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Collected: 8/18/11 1018
Date Received: 8/19/11
Date Analyzed: 8/31/11 10:33

Sample Name: LC34-RW0007-038.5-20110818
Lab Code: R1104645-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star040.run

Analysis Lot: 259661
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	53		1.0	
74-85-1	Ethene	14		1.0	
74-82-8	Methane	76		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Collected: 8/18/11 1018
Date Received: 8/19/11
Date Analyzed: 8/25/11 15:15

Sample Name: LC34-RW0007-038.5-20110818
Lab Code: R1104645-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\082511\X0006267.D\

Analysis Lot: 258928
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	380	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	320	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	11	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110818
Lab Code: R1104645-003

Service Request: R1104645
Date Collected: 8/18/11 1105
Date Received: 8/19/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	369	mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	8.4	mg/L	1.0	10	NA	8/19/11 14:23	
Carbon, Total Organic (TOC), Average	9060A	177	mg/L	20	20	NA	8/29/11 20:48	
Chloride	300.0	641	mg/L	20	100	NA	8/19/11 14:51	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	9/1/11 14:11	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/19/11 14:23	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	8/19/11 14:51	
Sulfate	300.0	3.2	mg/L	2.0	10	NA	8/19/11 14:23	
Sulfide, Total	SM 4500-S2- F	16.2	mg/L	0.98	1	NA	8/22/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110818 Dissolved
Lab Code: R1104645-004

Service Request: R1104645
Date Collected: 8/18/11 1105
Date Received: 8/19/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	9/8/11 13:53	
Iron, Dissolved	6010C	120		µg/L	100	1	8/24/11	9/8/11 13:53	
Manganese, Dissolved	6010C	20		µg/L	10	1	8/24/11	8/31/11 02:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110818
 Lab Code: R1104645-003

Service Request: R1104645
 Date Collected: 8/18/11 1105
 Date Received: 8/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	10	NA	8/24/11 16:16		258801	
1,1,2,2-Tetrachloroethane	50	U	50	10	NA	8/24/11 16:16		258801	
1,1,2-Trichloroethane	50	U	50	10	NA	8/24/11 16:16		258801	
1,1,2-Trichloro-1,2,2-trifluoroethane	580		50	10	NA	8/24/11 16:16		258801	
1,1-Dichloroethane (1,1-DCA)	50	U	50	10	NA	8/24/11 16:16		258801	
1,1-Dichloroethene (1,1-DCE)	50	U	50	10	NA	8/24/11 16:16		258801	
1,2,4-Trichlorobenzene	50	U	50	10	NA	8/24/11 16:16		258801	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	10	NA	8/24/11 16:16		258801	
1,2-Dibromoethane	50	U	50	10	NA	8/24/11 16:16		258801	
1,2-Dichlorobenzene	50	U	50	10	NA	8/24/11 16:16		258801	
1,2-Dichloroethane	50	U	50	10	NA	8/24/11 16:16		258801	
1,2-Dichloropropane	50	U	50	10	NA	8/24/11 16:16		258801	
1,3-Dichlorobenzene	50	U	50	10	NA	8/24/11 16:16		258801	
1,4-Dichlorobenzene	50	U	50	10	NA	8/24/11 16:16		258801	
n-Butanol	9300		2500	10	NA	8/24/11 16:16		258801	
2-Butanone (MEK)	100	U	100	10	NA	8/24/11 16:16		258801	
2-Hexanone	100	U	100	10	NA	8/24/11 16:16		258801	
4-Methyl-2-pentanone	100	U	100	10	NA	8/24/11 16:16		258801	
Acetone	200	U	200	10	NA	8/24/11 16:16		258801	
Benzene	50	U	50	10	NA	8/24/11 16:16		258801	
Bromodichloromethane	50	U	50	10	NA	8/24/11 16:16		258801	
Bromoform	50	U	50	10	NA	8/24/11 16:16		258801	
Bromomethane	50	U	50	10	NA	8/24/11 16:16		258801	
Carbon Disulfide	100	U	100	10	NA	8/24/11 16:16		258801	
Carbon Tetrachloride	50	U	50	10	NA	8/24/11 16:16		258801	
Chlorobenzene	50	U	50	10	NA	8/24/11 16:16		258801	
Chloroethane	50	U	50	10	NA	8/24/11 16:16		258801	
Chloroform	50	U	50	10	NA	8/24/11 16:16		258801	
Chloromethane	50	U	50	10	NA	8/24/11 16:16		258801	
Cyclohexane	100	U	100	10	NA	8/24/11 16:16		258801	
Dibromochloromethane	50	U	50	10	NA	8/24/11 16:16		258801	
Dichlorodifluoromethane (CFC 12)	50	U	50	10	NA	8/24/11 16:16		258801	
Dichloromethane	50	U	50	10	NA	8/24/11 16:16		258801	
Ethylbenzene	50	U	50	10	NA	8/24/11 16:16		258801	
Isopropylbenzene (Cumene)	50	U	50	10	NA	8/24/11 16:16		258801	
Methyl Acetate	100	U	100	10	NA	8/24/11 16:16		258801	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110818
 Lab Code: R1104645-003

Service Request: R1104645
 Date Collected: 8/18/11 1105
 Date Received: 8/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50	U	50	10	NA	8/24/11 16:16		258801	
Methylcyclohexane	100	U	100	10	NA	8/24/11 16:16		258801	
Styrene	50	U	50	10	NA	8/24/11 16:16		258801	
Tetrachloroethene (PCE)	50	U	50	10	NA	8/24/11 16:16		258801	
Toluene	50	U	50	10	NA	8/24/11 16:16		258801	
Trichloroethene (TCE)	1700		50	10	NA	8/24/11 16:16		258801	
Trichlorofluoromethane (CFC 11)	50	U	50	10	NA	8/24/11 16:16		258801	
Vinyl Chloride	94		50	10	NA	8/24/11 16:16		258801	
cis-1,2-Dichloroethene	890		50	10	NA	8/24/11 16:16		258801	
cis-1,3-Dichloropropene	50	U	50	10	NA	8/24/11 16:16		258801	
m,p-Xylenes	50	U	50	10	NA	8/24/11 16:16		258801	
n-Butyl Acetate	50	U	50	10	NA	8/24/11 16:16		258801	
o-Xylene	50	U	50	10	NA	8/24/11 16:16		258801	
trans-1,2-Dichloroethene	50	U	50	10	NA	8/24/11 16:16		258801	
trans-1,3-Dichloropropene	50	U	50	10	NA	8/24/11 16:16		258801	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	8/24/11 16:16	
Dibromofluoromethane	108	89-119	8/24/11 16:16	
Toluene-d8	106	87-121	8/24/11 16:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110818
Lab Code: R1104645-003

Service Request: R1104645
Date Collected: 8/18/11 1105
Date Received: 8/19/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	5.2		2.0	2	NA	8/31/11 10:43		259661	
Ethene	7.8		2.0	2	NA	8/31/11 10:43		259661	
Methane	300	D	8.0	4	NA	8/31/11 11:05		259661	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Collected: 8/18/11 1105
Date Received: 8/19/11
Date Analyzed: 8/25/11 13:12

Sample Name: LC34-RW0008-052.0-20110818
Lab Code: R1104645-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUADATA\HPLC05\DATA\082511\X0006265.D\

Analysis Lot: 258928
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	230	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	150	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	12	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110818
 Lab Code: RI104645-005

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
n-Butanol	250	U	250	1	NA	8/23/11 20:10		258589	
2-Butanone (MEK)	10	U	10	1	NA	8/23/11 20:10		258589	
2-Hexanone	10	U	10	1	NA	8/23/11 20:10		258589	
4-Methyl-2-pentanone	10	U	10	1	NA	8/23/11 20:10		258589	
Acetone	20	U	20	1	NA	8/23/11 20:10		258589	
Benzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Bromodichloromethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Bromoform	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Bromomethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Carbon Disulfide	10	U	10	1	NA	8/23/11 20:10		258589	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Chlorobenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Chloroethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Chloroform	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Chloromethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Cyclohexane	10	U	10	1	NA	8/23/11 20:10		258589	
Dibromochloromethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Dichloromethane	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Ethylbenzene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Methyl Acetate	10	U	10	1	NA	8/23/11 20:10		258589	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110818
Lab Code: R1104645-005

Service Request: R1104645
Date Collected: 8/18/11
Date Received: 8/19/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Methylcyclohexane	10	U	10	1	NA	8/23/11 20:10		258589	
Styrene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Toluene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
Vinyl Chloride	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
m,p-Xylenes	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
o-Xylene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/23/11 20:10		258589	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	8/23/11 20:10	
Dibromofluoromethane	103	89-119	8/23/11 20:10	
Toluene-d8	104	87-121	8/23/11 20:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104645-MB

Service Request: R1104645
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/19/11 13:07	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	8/29/11 17:29	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/19/11 13:07	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	9/1/11 13:38	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/19/11 13:07	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/19/11 13:07	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/19/11 13:07	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	8/22/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104645-MB1

Service Request: R1104645
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	9/8/11 13:13	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/24/11	9/8/11 13:13	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	8/30/11 23:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104645-MB2

Service Request: R1104645
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	9/8/11 13:19	
Iron, Dissolved	6010C	100	U	µg/L	100	1	8/24/11	9/8/11 13:19	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	8/24/11	8/31/11 00:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1108268-01

Service Request: R1104645
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
n-Butanol	250	U	250	1	NA	8/23/11 12:37		258589	
2-Butanone (MEK)	10	U	10	1	NA	8/23/11 12:37		258589	
2-Hexanone	10	U	10	1	NA	8/23/11 12:37		258589	
4-Methyl-2-pentanone	10	U	10	1	NA	8/23/11 12:37		258589	
Acetone	20	U	20	1	NA	8/23/11 12:37		258589	
Benzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Bromodichloromethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Bromoform	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Bromomethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Carbon Disulfide	10	U	10	1	NA	8/23/11 12:37		258589	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Chlorobenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Chloroethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Chloroform	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Chloromethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Cyclohexane	10	U	10	1	NA	8/23/11 12:37		258589	
Dibromochloromethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Dichloromethane	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Ethylbenzene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Methyl Acetate	10	U	10	1	NA	8/23/11 12:37		258589	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108268-01

Service Request: R1104645
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Methylcyclohexane	10	U	10	1	NA	8/23/11 12:37		258589	
Styrene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Toluene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
Vinyl Chloride	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
m,p-Xylenes	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
o-Xylene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/23/11 12:37		258589	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	8/23/11 12:37	
Dibromofluoromethane	105	89-119	8/23/11 12:37	
Toluene-d8	104	87-121	8/23/11 12:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1108364-01

Service Request: R1104645
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,1,2-Trichloroethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2,4-Trichlorobenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2-Dibromoethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2-Dichlorobenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2-Dichloroethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,2-Dichloropropane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,3-Dichlorobenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
1,4-Dichlorobenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
n-Butanol	250	U	250	1	NA	8/24/11 15:17		258801	
2-Butanone (MEK)	10	U	10	1	NA	8/24/11 15:17		258801	
2-Hexanone	10	U	10	1	NA	8/24/11 15:17		258801	
4-Methyl-2-pentanone	10	U	10	1	NA	8/24/11 15:17		258801	
Acetone	20	U	20	1	NA	8/24/11 15:17		258801	
Benzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Bromodichloromethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Bromoform	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Bromomethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Carbon Disulfide	10	U	10	1	NA	8/24/11 15:17		258801	
Carbon Tetrachloride	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Chlorobenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Chloroethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Chloroform	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Chloromethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Cyclohexane	10	U	10	1	NA	8/24/11 15:17		258801	
Dibromochloromethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Dichloromethane	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Ethylbenzene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Isopropylbenzene (Cumene)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Methyl Acetate	10	U	10	1	NA	8/24/11 15:17		258801	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108364-01

Service Request: R1104645
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Methylcyclohexane	10	U	10	1	NA	8/24/11 15:17		258801	
Styrene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Tetrachloroethene (PCE)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Toluene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Trichloroethene (TCE)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
Vinyl Chloride	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
cis-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
cis-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
m,p-Xylenes	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
n-Butyl Acetate	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
o-Xylene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
trans-1,2-Dichloroethene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	
trans-1,3-Dichloropropene	5.0	U	5.0	1	NA	8/24/11 15:17		258801	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	8/24/11 15:17	
Dibromofluoromethane	105	89-119	8/24/11 15:17	
Toluene-d8	104	87-121	8/24/11 15:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Collected: NA
Date Received: NA
Date Analyzed: 8/31/11 09:46

Sample Name: Method Blank
Lab Code: RQ1108595-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star016.run

Analysis Lot: 259661
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	2.0	U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Collected: NA
Date Received: NA
Date Analyzed: 8/24/11 17:33

Sample Name: Method Blank
Lab Code: RQ1109006-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\082411\X0006247.D\

Analysis Lot: 258928
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11
 Date Analyzed: 8/19/11 -
 8/29/11

Replicate Sample Summary
 General Chemistry Parameters

Sample Name: LC34-RW0007-038.5-20110818
 Lab Code: R1104645-001

Units: mg/L
 Basis: NA

Analyte Name	Method	MRL	Sample Result	LC34-RW0007-038.5 -20110818DUP Duplicate Sample R1104645-001DUP		RPD	RPD Limit
				Result	Average		
Bromide	300.0	1.0	25.6	25.2	25.4	2	20
Nitrate as Nitrogen	300.0	1.0	1.0 U	1.0 U	NC	NC	20
Sulfate	300.0	2.0	2.0 U	2.0 U	NC	NC	20
Carbon, Total Organic (TOC), Average	9060A	50	363	358	360	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11
 Date Analyzed: 8/19/11

Matrix Spike Summary
 General Chemistry Parameters

Sample Name: LC34-RW0007-038.5-20110818
 Lab Code: R1104645-001

Units: mg/L
 Basis: NA

Analytical Method: 300.0

LC34-RW0007-038.5-20110818

MS

Matrix Spike
 R1104645-001MS1

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	25.6	32.9	10.0	72 *	90 - 110
Nitrate as Nitrogen	ND	9.62	10.0	96	90 - 110
Sulfate	ND	22.6	20.0	113 *	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11
 Date Analyzed: 8/29/11

Matrix Spike Summary
 General Chemistry Parameters

Sample Name: LC34-RW0008-052.0-20110818
 Lab Code: R1104645-003

Units: mg/L
 Basis: NA

Analytical Method: 9060A

LC34-RW0008-052.0-20110818

MS

Matrix Spike
 R1104645-003MS2

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	177	374	200	99	62 - 135

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11
 Date Analyzed: 8/24/11 - 8/25/11

Matrix Spike Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-RW0008-052.0-20110818
 Lab Code: R1104645-003

Units: µg/L
 Basis: NA

Analytical Method: 8260C

LC34-RW0008-052.0-20110818 MS LC34-RW0008-052.0-20110818 DMS

Matrix Spike
 RQ1108364-05

Duplicate Matrix Spike
 RQ1108364-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane (TCA)	ND	510	500	102	517	500	103	76 - 142	2	30
1,1,2,2-Tetrachloroethane	ND	511	500	102	515	500	103	71 - 120	<1	30
1,1,2-Trichloroethane	ND	524	500	105	535	500	107	80 - 119	2	30
1,1,2-Trichloro-1,2,2-trifluoroethane	580	1010	500	85	938	500	71	65 - 154	7	30
1,1-Dichloroethane (1,1-DCA)	ND	514	500	103	531	500	106	79 - 134	3	30
1,1-Dichloroethene (1,1-DCE)	ND	469	500	94	488	500	98	71 - 143	4	30
1,2,4-Trichlorobenzene	ND	472	500	94	494	500	99	75 - 118	4	30
1,2-Dibromo-3-chloropropane (DBC)	ND	489	500	98	513	500	103	60 - 125	5	30
1,2-Dibromoethane	ND	523	500	105	540	500	108	78 - 119	3	30
1,2-Dichlorobenzene	ND	482	500	96	490	500	98	82 - 117	2	30
1,2-Dichloroethane	ND	548	500	110	548	500	110	73 - 133	<1	30
1,2-Dichloropropane	ND	525	500	105	534	500	107	84 - 124	2	30
1,3-Dichlorobenzene	ND	468	500	94	473	500	95	82 - 117	1	30
1,4-Dichlorobenzene	ND	465	500	93	468	500	94	81 - 116	<1	30
n-Butanol	9300	39400	25000	121	41000	25000	127	50 - 150	4	30
2-Butanone (MEK)	ND	558	500	112	560	500	112	54 - 130	<1	30
2-Hexanone	ND	518	500	104	537	500	107	55 - 125	4	30
4-Methyl-2-pentanone	ND	547	500	109	544	500	109	59 - 131	<1	30
Acetone	ND	601	500	120	451	500	90	37 - 152	29	30
Benzene	ND	483	500	97	497	500	99	81 - 124	3	30
Bromodichloromethane	ND	548	500	110	552	500	110	81 - 126	<1	30
Bromoform	ND	503	500	101	511	500	102	61 - 126	2	30
Bromomethane	ND	170	500	34 *	179	500	36 *	45 - 154	5	30
Carbon Disulfide	ND	589	500	118	551	500	110	32 - 149	7	30
Carbon Tetrachloride	ND	518	500	104	516	500	103	71 - 146	<1	30
Chlorobenzene	ND	487	500	97	493	500	99	80 - 125	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Collected: 8/18/11
 Date Received: 8/19/11
 Date Analyzed: 8/24/11 - 8/25/11

Matrix Spike Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-RW0008-052.0-20110818
 Lab Code: R1104645-003

Units: µg/L
 Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-RW0008-052.0-20110818 MS			LC34-RW0008-052.0-20110818 DMS			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chloroethane	ND	615	500	123	593	500	119	68 - 148	4	30
Chloroform	ND	544	500	109	545	500	109	81 - 131	<1	30
Chloromethane	ND	499	500	100	523	500	105	61 - 151	5	30
Cyclohexane	ND	554	500	111	494	500	99	59 - 144	12	30
Dibromochloromethane	ND	533	500	107	550	500	110	74 - 130	3	30
Dichlorodifluoromethane (CFC 12)	ND	495	500	99	477	500	95	44 - 175	4	30
Dichloromethane	ND	503	500	101	519	500	104	78 - 125	3	30
Ethylbenzene	ND	512	500	102	526	500	105	84 - 127	3	30
Isopropylbenzene (Cumene)	ND	571	500	114	583	500	117	82 - 140	2	30
Methyl Acetate	ND	849	500	170 *	840	500	168 *	38 - 156	1	30
Methyl tert-Butyl Ether	ND	509	500	102	533	500	107	75 - 126	5	30
Methylcyclohexane	ND	558	500	112	501	500	100	63 - 141	11	30
Styrene	ND	529	500	106	551	500	110	43 - 146	4	30
Tetrachloroethene (PCE)	ND	468	500	94	487	500	97	66 - 142	4	30
Toluene	ND	502	500	100	508	500	102	81 - 125	1	30
Trichloroethene (TCE)	1700	2240	500	116	2120	500	93	71 - 133	5	30
Trichlorofluoromethane (CFC 11)	ND	571	500	114	549	500	110	71 - 159	4	30
Vinyl Chloride	94	626	500	106	656	500	112	72 - 154	5	30
cis-1,2-Dichloroethene	890	1500	500	122	1450	500	112	72 - 137	3	30
cis-1,3-Dichloropropene	ND	428	500	86	441	500	88	71 - 120	3	30
m,p-Xylenes	ND	1050	1000	105	1070	1000	107	80 - 129	2	30
n-Butyl Acetate	ND	108	500	22	103	500	21	18 - 159	5	30
o-Xylene	ND	530	500	106	545	500	109	80 - 126	3	30
trans-1,2-Dichloroethene	ND	512	500	102	516	500	103	77 - 130	<1	30
trans-1,3-Dichloropropene	ND	454	500	91	464	500	93	67 - 122	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/22/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Analyte Name	Method	Lab Control Sample R1104645-LCSI			Duplicate Lab Control Sample R1104645-DLCSI			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.32	5.9	107	6.20	5.9	105	56 - 138	2	20

Units: mg/L
Basis: NA

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/19/11 -
 9/ 1/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104645-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.04	1.00	104	90 - 110
Chloride	300.0	2.11	2.00	105	90 - 110
Iodide	300.0	0.971	1.00	97	90 - 110
Nitrate as Nitrogen	300.0	1.09	1.00	109	90 - 110
Sulfate	300.0	2.19	2.00	110	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.0	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117
Nitrite as Nitrogen	300.0	1.02	1.00	102	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/31/11 -
9/8/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L

Basis: NA

Lab Control Sample
R1104645-LCS

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Arsenic, Dissolved	6010C	36.7	40	92	80 - 120	
Iron, Dissolved	6010C	948	1000	95	80 - 120	
Manganese, Dissolved	6010C	505	500	101	80 - 120	

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/23/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 258589

**Lab Control Sample
 RQ1108268-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	99	72 - 128
1,1,2,2-Tetrachloroethane	18.8	20.0	94	72 - 131
1,1,2-Trichloroethane	18.9	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.0	20.0	100	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.8	20.0	99	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.1	20.0	95	72 - 129
1,2,4-Trichlorobenzene	19.4	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.7	20.0	84	62 - 131
1,2-Dibromoethane	19.3	20.0	97	78 - 125
1,2-Dichlorobenzene	19.6	20.0	98	79 - 124
1,2-Dichloroethane	20.2	20.0	101	73 - 127
1,2-Dichloropropane	19.9	20.0	99	80 - 123
1,3-Dichlorobenzene	19.6	20.0	98	78 - 124
1,4-Dichlorobenzene	19.1	20.0	96	78 - 123
n-Butanol	958	1000	96	70 - 130
2-Butanone (MEK)	18.4	20.0	92	60 - 133
2-Hexanone	16.5	20.0	83	61 - 131
4-Methyl-2-pentanone	17.4	20.0	87	61 - 132
Acetone	19.1	20.0	95	54 - 139
Benzene	19.0	20.0	95	78 - 121
Bromodichloromethane	20.3	20.0	102	80 - 125
Bromoform	19.3	20.0	97	68 - 130
Bromomethane	22.8	20.0	114	57 - 144
Carbon Disulfide	23.4	20.0	117	52 - 140
Carbon Tetrachloride	20.4	20.0	102	68 - 133
Chlorobenzene	19.5	20.0	98	80 - 121
Chloroethane	22.0	20.0	110	71 - 130
Chloroform	20.7	20.0	104	78 - 125
Chloromethane	20.5	20.0	103	61 - 138
Cyclohexane	19.2	20.0	96	57 - 126
Dibromochloromethane	20.1	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	20.1	20.0	100	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Analyzed: 8/23/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 258589

Lab Control Sample
 RQ1108268-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.4	20.0	97	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	22.5	20.0	112	73 - 133
Methyl Acetate	19.8	20.0	99	57 - 157
Methyl tert-Butyl Ether	18.7	20.0	93	75 - 126
Methylcyclohexane	19.9	20.0	100	61 - 125
Styrene	21.3	20.0	107	80 - 132
Tetrachloroethene (PCE)	19.4	20.0	97	72 - 131
Toluene	19.4	20.0	97	78 - 122
Trichloroethene (TCE)	19.2	20.0	96	74 - 127
Trichlorofluoromethane (CFC 11)	22.2	20.0	111	69 - 141
Vinyl Chloride	22.1	20.0	111	72 - 138
cis-1,2-Dichloroethene	19.8	20.0	99	78 - 122
cis-1,3-Dichloropropene	18.6	20.0	93	77 - 125
m,p-Xylenes	41.8	40.0	105	79 - 126
n-Butyl Acetate	15.7	20.0	78	31 - 144
o-Xylene	20.2	20.0	101	77 - 118
trans-1,2-Dichloroethene	19.5	20.0	98	75 - 121
trans-1,3-Dichloropropene	18.6	20.0	93	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/24/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 258801

**Lab Control Sample
 RQ1108364-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.2	20.0	91	72 - 128
1,1,2,2-Tetrachloroethane	17.3	20.0	86	72 - 131
1,1,2-Trichloroethane	17.5	20.0	88	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.3	20.0	92	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.4	20.0	92	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.3	20.0	87	72 - 129
1,2,4-Trichlorobenzene	17.3	20.0	86	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	15.0	20.0	75	62 - 131
1,2-Dibromoethane	17.9	20.0	89	78 - 125
1,2-Dichlorobenzene	17.7	20.0	89	79 - 124
1,2-Dichloroethane	18.8	20.0	94	73 - 127
1,2-Dichloropropane	18.3	20.0	92	80 - 123
1,3-Dichlorobenzene	17.3	20.0	87	78 - 124
1,4-Dichlorobenzene	17.1	20.0	86	78 - 123
n-Butanol	999	1000	100	70 - 130
2-Butanone (MEK)	19.5	20.0	98	60 - 133
2-Hexanone	16.8	20.0	84	61 - 131
4-Methyl-2-pentanone	17.9	20.0	89	61 - 132
Acetone	18.8	20.0	94	54 - 139
Benzene	17.4	20.0	87	78 - 121
Bromodichloromethane	18.7	20.0	93	80 - 125
Bromoform	17.0	20.0	85	68 - 130
Bromomethane	20.1	20.0	100	57 - 144
Carbon Disulfide	22.0	20.0	110	52 - 140
Carbon Tetrachloride	18.4	20.0	92	68 - 133
Chlorobenzene	17.7	20.0	89	80 - 121
Chloroethane	20.0	20.0	100	71 - 130
Chloroform	18.9	20.0	94	78 - 125
Chloromethane	18.6	20.0	93	61 - 138
Cyclohexane	21.2	20.0	106	57 - 126
Dibromochloromethane	18.3	20.0	92	78 - 133
Dichlorodifluoromethane (CFC 12)	18.1	20.0	90	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/24/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 258801

**Lab Control Sample
 RQ1108364-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.0	20.0	90	75 - 125
Ethylbenzene	18.2	20.0	91	78 - 123
Isopropylbenzene (Cumene)	19.9	20.0	99	73 - 133
Methyl Acetate	21.2	20.0	106	57 - 157
Methyl tert-Butyl Ether	17.1	20.0	85	75 - 126
Methylcyclohexane	21.6	20.0	108	61 - 125
Styrene	19.3	20.0	97	80 - 132
Tetrachloroethene (PCE)	17.6	20.0	88	72 - 131
Toluene	17.8	20.0	89	78 - 122
Trichloroethene (TCE)	17.7	20.0	89	74 - 127
Trichlorofluoromethane (CFC 11)	20.1	20.0	100	69 - 141
Vinyl Chloride	20.3	20.0	101	72 - 138
cis-1,2-Dichloroethene	18.4	20.0	92	78 - 122
cis-1,3-Dichloropropene	17.2	20.0	86	77 - 125
m,p-Xylenes	38.1	40.0	95	79 - 126
n-Butyl Acetate	17.7	20.0	88	31 - 144
o-Xylene	18.3	20.0	92	77 - 118
trans-1,2-Dichloroethene	18.2	20.0	91	75 - 121
trans-1,3-Dichloropropene	16.8	20.0	84	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272
Sample Matrix: Water

Service Request: R1104645
Date Analyzed: 8/31/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 259661

Analyte Name	Lab Control Sample RQ1108595-02			Duplicate Lab Control Sample RQ1108595-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	28.9	26.1	111	27.1	26.1	104	56 - 148	7	30
Ethene	25.0	24.3	103	23.4	24.3	96	58 - 155	7	30
Methane	28.9	26.2	110	27.0	26.2	103	55 - 150	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272
 Sample Matrix: Water

Service Request: R1104645
 Date Analyzed: 8/24/11

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
 Basis: NA

Analysis Lot: 258928

Analyte Name	Lab Control Sample RQ1109006-02			Duplicate Lab Control Sample RQ1109006-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.18	1.00	118	1.14	1.00	114	70 - 130	3	30
Acetic Acid	9.79	10.0	98	9.67	10.0	97	70 - 135	1	30
Butanoic Acid (Butyric Acid)	10.5	10.0	105	9.76	10.0	98	78 - 113	7	30
Lactic Acid	9.37	9.97	94	9.34	9.97	94	61 - 109	<1	30
Propionic Acid	9.59	9.97	96	9.42	9.97	95	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20110818	08/18/11	1018	-001-002	W
LC34-RW0008-052.0-20110818	08/18/11	1105	-003-004	W
LC34-TR-20110818	08/18/11	NA	-005	W

Number of Containers	Analysis Requested							REMARKS
	VOCs (8260C) plus n-butyl acetate	VEAs (300)	Bromide and Iodide with Antons (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	
15	3	2	1	3	1	3	1	1
15	3	2	1	3	1	3	1	1
3	3							

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?; NASA KEDD

INVOICE INFORMATION
 P.O. # _____
 Bill to: TR0272

RECEIVED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARTLETT
 Firm: GEOSYNTEC
 Date/Time: 08/18/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Lafont
 Firm: CAS
 Date/Time: 8/19/11 0944

Comments/Special Instructions:
 Please filter dissolved metals in lab.

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Lafont
 Firm: CAS
 Date/Time: 8/19/11 0944

R11104645
 GeoSyntec Consultants
 ESTCP PED LC34 TR0272



Cooler Receipt And Preservation Check Form

Project/Client Acrylatec Folder Number R110 4645

Cooler received on 8/19/11 by: PO COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 33°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/19/11 0955

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 8/19/11

Cooler Breakdown: Date: 8/19/11 Time: 1315 by: PO

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH			?						No = Samples were preserved at lab as listed
≤2	HNO ₃									
≤2	H ₂ SO ₄									
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid						PM OK to Adjust: _____
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet				
	Zn Aceta	-	-	?						
	HCl	*	*	<u>4110060</u>	<u>7/12</u>					

Bottle lot numbers: 072511-2PP, 1-087-002, #110060 1-045-004

Other Comments: _____

*Sulfide bottle received w/ no indication of preservation
 w/ NaOH and Zn acetate. - Can see NaOH preservation pellets in bottom of 500 bottle, assumed OK.*

** - Please have WC analyst V after analysis*

PC Secondary Review: KB 9/12/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

September 14, 2011

Service Request No: R1104782

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 #TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on August 26, 2011. For your reference, these analyses have been assigned our service request number **R1104782**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 8/24/11
Sample Matrix: Water

Service Request No.: R1104782
Date Received: 8/26/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Three (3) water samples including one (1) Trip Blank were collected by the client on 8/24/11 and were received for analysis at Columbia Analytical Services on 8/26/11 via a national courier. The samples were received at a cooler temperature of 4.8°C within the guidelines of 0-6°C. Only 1 vial was received for the RSK-175. The analysis was not affected.

Organic Compounds

Three (3) water samples including one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except for the CCV for the compound Dichlorodifluoromethane which was >20%D (22.3%) on the 8/29/11 analytical run. Any hits for this compound associated with this run should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Site specific QC is included in the report for location LC34-RW0007-038.5-20110824 (CAS #R1104782-001) for Organic Acids. All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within limits. All Relative Percent Difference (RPD) calculations were acceptable. The compounds Acetic and Butyric Acids were spiked too low (<4X the concentration in the sample) to be accurately determined. The recoveries for these compounds are flagged as "#". The Laboratory Control Samples (LCS) and LCS Duplicate recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Hits between the Method Reporting Limit (MRL) and Minimum Detection Limit (MDL) are flagged as estimated, "J".

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

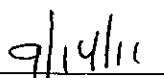
The Primary Standard mix for RSK expired on 8/6/11. The Secondary Standard mix expired on 8/9/11. Both standards have shown little to no degradation over the past year. New standards have been ordered but not yet received.

No other analytical or QC problems were encountered.

Approved by



Date



Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Sulfate and Nitrite and Nitrate by IC method 300.0, The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Site QC is included in the report for metals for location LC34-RW0007-038.5-20110824 (CAS #R1104782-002). All Matrix Spike (MS) recoveries were within QC acceptance limits. All Relative Percent Difference (RPD) calculations were acceptable. All Laboratory Control Sample (LCS) recoveries were within QC limits.

All holding times were met for these analyses for all analyses except for Nitrate and Nitrite which were received within approximately 1-2 hours of holding time. The samples were analyzed as soon as possible upon receipt. The data has been flagged as "*" for these analyses.

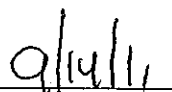
All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analyses of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1104782

<u>Lab ID</u>	<u>Client ID</u>
R1104782-001	LC34-RW0007-038.5-20110824
R1104782-002	LC34-RW0007-038.5-20110824 Dissolved
R1104782-003	LC34-RW0008-052.0-20110824
R1104782-004	LC34-RW0008-052.0-20110824 Dissolved
R1104782-005	Trip Blank

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110824
Lab Code: R1104782-001

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	498	mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	20.2	mg/L	1.0	10	NA	8/26/11 19:30	
Carbon, Total Organic (TOC), Average	9060A	322	mg/L	30	30	NA	9/2/11 19:01	
Chloride	300.0	516	mg/L	20	100	NA	8/26/11 19:57	
Iodide	300.0	10.8	mg/L	2.0	10	NA	9/1/11 14:20	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/26/11 19:30	*
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	8/26/11 19:57	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/26/11 19:30	
Sulfide, Total	SM 4500-S2- F	24.5	mg/L	1.0	1	NA	8/30/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110824 Dissolved
Lab Code: R1104782-002

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	9/ 1/11	9/9/11 17:18	
Iron, Dissolved	6010C	100 U	µg/L	100	1	9/ 1/11	9/8/11 22:31	
Manganese, Dissolved	6010C	25	µg/L	10	1	9/ 1/11	9/8/11 22:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11
Date Analyzed: 8/30/11 16:05

Sample Name: LC34-RW0007-038.5-20110824
Lab Code: R1104782-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\083011\D4459.D\

Analysis Lot: 259593
Instrument Name: R-MS-10
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13000		1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	26000	J	50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	4000	U	4000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	1000	U	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	2000	U	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	1000	U	1000	44	
74-87-3	Chloromethane	1000	U	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	
75-09-2	Dichloromethane	1000	U	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11
Date Analyzed: 8/30/11 16:05

Sample Name: LC34-RW0007-038.5-20110824
Lab Code: R1104782-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\083011\D4459.D\

Analysis Lot: 259593
Instrument Name: R-MS-10
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	10000		1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	1700		1000	46	
156-59-2	cis-1,2-Dichloroethene	21000		1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	1000	U	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	130	J	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	8/30/11 16:05	
Dibromofluoromethane	107	89-119	8/30/11 16:05	
Toluene-d8	106	87-121	8/30/11 16:05	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11
Date Analyzed: 9/2/11 10:51

Sample Name: LC34-RW0007-038.5-20110824
Lab Code: R1104782-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star088.run

Analysis Lot: 260455
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	50		1.0	
74-85-1	Ethene	12		1.0	
74-82-8	Methane	100		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1108
Date Received: 8/26/11
Date Analyzed: 8/31/11 11:25

Sample Name: LC34-RW0007-038.5-20110824
Lab Code: RI104782-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\083111\X0006291.D\

Analysis Lot: 259784
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	320	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	350	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	18	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110824
Lab Code: R1104782-003

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	368	mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	8.2	mg/L	1.0	10	NA	8/26/11 20:10	
Carbon, Total Organic (TOC), Average	9060A	147	mg/L	30	30	NA	9/2/11 19:41	
Chloride	300.0	604	mg/L	20	100	NA	8/26/11 20:36	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	9/1/11 14:28	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	8/26/11 20:10	*
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	8/26/11 20:36	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	8/26/11 20:10	
Sulfide, Total	SM 4500-S2- F	19.7	mg/L	1.0	1	NA	8/30/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110824 Dissolved
Lab Code: R1104782-004

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/ 1/11	9/9/11 17:58	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/ 1/11	9/8/11 23:02	
Manganese, Dissolved	6010C	22		µg/L	10	1	9/ 1/11	9/8/11 23:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11
Date Analyzed: 8/29/11 18:38

Sample Name: LC34-RW0008-052.0-20110824
Lab Code: R1104782-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\082911\D4438.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	580		50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	4.3	J	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	
106-93-4	1,2-Dibromoethane	50	U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.0	
107-06-2	1,2-Dichloroethane	50	U	50	2.0	
78-87-5	1,2-Dichloropropane	50	U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	2500	U	2500	110	
78-93-3	2-Butanone (MEK)	100	U	100	5.1	
591-78-6	2-Hexanone	100	U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100	U	100	2.7	
67-64-1	Acetone	18	J	200	9.8	
71-43-2	Benzene	50	U	50	2.1	
75-27-4	Bromodichloromethane	50	U	50	2.0	
75-25-2	Bromoform	50	U	50	2.7	
74-83-9	Bromomethane	50	U	50	3.1	
75-15-0	Carbon Disulfide	100	U	100	2.0	
56-23-5	Carbon Tetrachloride	50	U	50	2.7	
108-90-7	Chlorobenzene	50	U	50	2.0	
75-00-3	Chloroethane	50	U	50	3.1	
67-66-3	Chloroform	50	U	50	2.2	
74-87-3	Chloromethane	50	U	50	2.4	
110-82-7	Cyclohexane	100	U	100	2.4	
124-48-1	Dibromochloromethane	50	U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	
75-09-2	Dichloromethane	50	U	50	2.2	
100-41-4	Ethylbenzene	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11
Date Analyzed: 8/29/11 18:38

Sample Name: LC34-RW0008-052.0-20110824
Lab Code: R1104782-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\082911\D4438.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50 U	50	2.0	
79-20-9	Methyl Acetate	100 U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50 U	50	2.0	
108-87-2	Methylcyclohexane	100 U	100	2.5	
100-42-5	Styrene	50 U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50 U	50	2.0	
108-88-3	Toluene	50 U	50	2.0	
79-01-6	Trichloroethene (TCE)	1500	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50 U	50	2.0	
75-01-4	Vinyl Chloride	160	50	2.4	
156-59-2	cis-1,2-Dichloroethene	830	50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50 U	50	2.0	
179601-23-1	m,p-Xylenes	50 U	50	2.0	
123-86-4	n-Butyl Acetate	50 U	50	2.1	
95-47-6	o-Xylene	50 U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	3.9 J	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50 U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	8/29/11 18:38	
Dibromofluoromethane	110	89-119	8/29/11 18:38	
Toluene-d8	108	87-121	8/29/11 18:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110824
Lab Code: R1104782-003

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	4.3		2.0	2	NA	9/2/11 11:19		260455	
Ethene	9.3		2.0	2	NA	9/2/11 11:19		260455	
Methane	370	D	10	5	NA	9/2/11 11:32		260455	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11 1150
Date Received: 8/26/11
Date Analyzed: 8/30/11 16:18

Sample Name: LC34-RW0008-052.0-20110824
Lab Code: R1104782-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\083011\X0006277.D\

Analysis Lot: 259784
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	220	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	100	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	15	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11
Date Received: 8/26/11
Date Analyzed: 8/29/11 19:08

Sample Name: Trip Blank
Lab Code: R1104782-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\082911\D4439.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	0.21	J	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11
Date Received: 8/26/11
Date Analyzed: 8/29/11 19:08

Sample Name: Trip Blank
Lab Code: R1104782-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\082911\D4439.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	111	85-122	8/29/11 19:08	
Dibromofluoromethane	108	89-119	8/29/11 19:08	
Toluene-d8	108	87-121	8/29/11 19:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104782-MB1

Service Request: R1104782
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	8/31/11 11:30	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	8/26/11 18:00	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/2/11 13:53	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	8/26/11 18:00	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	9/1/11 13:38	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/26/11 18:00	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	8/26/11 18:00	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	8/26/11 18:00	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	8/30/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104782-MB2

Service Request: R1104782
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfide, Total	SM 4500-S2- F	1.0 U	mg/L	1.0	1	NA	8/30/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104782-MB1

Service Request: R1104782
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/ 1/11	9/9/11 17:01	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/ 1/11	9/8/11 22:10	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/ 1/11	9/8/11 22:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104782-MB2

Service Request: R1104782
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/ 1/11	9/9/11 17:07	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/ 1/11	9/8/11 22:17	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/ 1/11	9/8/11 22:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: NA
Date Received: NA
Date Analyzed: 8/29/11 13:10

Sample Name: Method Blank
Lab Code: RQ1108651-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\082911\D4427.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: NA
Date Received: NA
Date Analyzed: 8/29/11 13:10

Sample Name: Method Blank
Lab Code: RQ1108651-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\082911\D4427.D\

Analysis Lot: 259408
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	8/29/11 13:10	
Dibromofluoromethane	104	89-119	8/29/11 13:10	
Toluene-d8	106	87-121	8/29/11 13:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 #TR0272
 Sample Matrix: Water

Service Request: R1104782
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/30/11 12:36

Sample Name: Method Blank
 Lab Code: RQ1108621-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\083011\D4452.D\

Analysis Lot: 259593
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	20	U	20	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

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Analytical Report

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Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: NA
Date Received: NA
Date Analyzed: 8/30/11 12:36

Sample Name: Method Blank
Lab Code: RQ1108621-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\083011\D4452.D\

Analysis Lot: 259593
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	8/30/11 12:36	
Dibromofluoromethane	106	89-119	8/30/11 12:36	
Toluene-d8	104	87-121	8/30/11 12:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: NA
Date Received: NA
Date Analyzed: 9/2/11 09:21

Sample Name: Method Blank
Lab Code: RQ1108845-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star083.run

Analysis Lot: 260455
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: NA
Date Received: NA
Date Analyzed: 8/30/11 13:23

Sample Name: Method Blank
Lab Code: RQ1108668-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\083011\X0006274.D\

Analysis Lot: 259784
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 #TR0272
 Sample Matrix: Water

Service Request: R1104782
 Date Collected: 8/24/11
 Date Received: 8/26/11
 Date Analyzed: 9/ 8/11 -
 9/ 9/11

Replicate Sample Summary
 Inorganic Parameters

Sample Name: LC34-RW0007-038.5-20110824 Dissolved
 Lab Code: R1104782-002

Units: µg/L
 Basis: NA

LC34-RW0007-038.5
 -20110824

DissolvedDUP

Duplicate Sample

R1104782-002DUP

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Arsenic, Dissolved	6010C	10	10 U	10 U	NC	NC	20
Iron, Dissolved	6010C	100	100 U	100 U	NC	NC	20
Manganese, Dissolved	6010C	10	25	25	25.2	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 #TR0272
 Sample Matrix: Water

Service Request: R1104782
 Date Collected: 8/24/11
 Date Received: 8/26/11
 Date Analyzed: 9/ 8/11 - 9/ 9/11

Matrix Spike Summary
 Inorganic Parameters

Sample Name: LC34-RW0007-038.5-20110824 Dissolved
 Lab Code: R1104782-002

Units: µg/L
 Basis: NA

Analytical Method: 6010C
 Prep Method: EPA 3010A

LC34-RW0007-038.5-20110824
 DissolvedMS
 Matrix Spike
 R1104782-002MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	ND	38.5	40	96	75 - 125
Iron, Dissolved	ND	934	1000	93	75 - 125
Manganese, Dissolved	25	497	500	94	75 - 125

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Collected: 8/24/11
Date Received: 8/26/11
Date Analyzed: 8/31/11

Matrix Spike Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-RW0007-038.5-20110824
Lab Code: R1104782-001

Units: mg/L
Basis: NA

Analytical Method: Organic Acids

Analyte Name	Sample Result	LC34-RW0007-038.5-20110824 MS Matrix Spike RQ1108668-04			LC34-RW0007-038.5-20110824 DMS Duplicate Matrix Spike RQ1108668-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	5.55	5.00	111	5.50	5.00	110	25 - 152	<1	30
Acetic Acid	320	363	50.0	86 #	366	50.0	92 #	13 - 167	<1	30
Butanoic Acid (Butyric Acid)	350	396	50.0	98 #	398	50.0	102 #	49 - 145	<1	30
Lactic Acid	ND	47.9	49.9	96	48.7	49.9	98	27 - 127	2	30
Propionic Acid	18	66.5	49.8	97	65.1	49.8	95	68 - 133	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/30/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104782-LCS1			Duplicate Lab Control Sample R1104782-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.73	5.7	101	5.88	5.7	104	56 - 138	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/30/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104782-LCS2			Duplicate Lab Control Sample R1104782-DLCS2			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.77	5.9	98	5.89	5.9	100	56 - 138	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/26/11 -
 9/ 2/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104782-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.03	1.00	103	90 - 110
Chloride	300.0	2.02	2.00	101	90 - 110
Iodide	300.0	0.971	1.00	97	90 - 110
Nitrate as Nitrogen	300.0	0.992	1.00	99	90 - 110
Sulfate	300.0	2.01	2.00	101	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	21.0	20.0	105	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117
Nitrite as Nitrogen	300.0	0.997	1.00	100	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 9/ 8/11 -
9/ 9/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1104782-LCS

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	35.3	40	88	80 - 120
Iron, Dissolved	6010C	971	1000	97	80 - 120
Manganese, Dissolved	6010C	488	500	98	80 - 120

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 #TR0272
 Sample Matrix: Water

Service Request: R1104782
 Date Analyzed: 8/29/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 259408

Analyte Name	Lab Control Sample RQ1108651-02			Duplicate Lab Control Sample RQ1108651-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	21.5	20.0	108	17.7	20.0	89	72 - 128	19	30
1,1,2,2-Tetrachloroethane	19.0	20.0	95	16.9	20.0	84	72 - 131	12	30
1,1,2-Trichloroethane	21.5	20.0	107	18.5	20.0	93	80 - 122	15	30
1,1,2-Trichloro-1,2,2-trifluoroethane	21.9	20.0	109	17.5	20.0	88	68 - 136	22	30
1,1-Dichloroethane (1,1-DCA)	22.3	20.0	111	19.0	20.0	95	76 - 124	16	30
1,1-Dichloroethene (1,1-DCE)	20.8	20.0	104	17.2	20.0	86	72 - 129	19	30
1,2,4-Trichlorobenzene	18.9	20.0	94	15.1	20.0	76	70 - 133	22	30
1,2-Dibromo-3-chloropropane (DBCP)	18.2	20.0	91	14.6	20.0	73	62 - 131	22	30
1,2-Dibromoethane	20.2	20.0	101	17.9	20.0	89	78 - 125	12	30
1,2-Dichlorobenzene	19.0	20.0	95	16.4	20.0	82	79 - 124	15	30
1,2-Dichloroethane	22.3	20.0	111	19.3	20.0	96	73 - 127	14	30
1,2-Dichloropropane	21.9	20.0	109	18.8	20.0	94	80 - 123	15	30
1,3-Dichlorobenzene	18.3	20.0	92	15.7	20.0	79	78 - 124	15	30
1,4-Dichlorobenzene	18.4	20.0	92	15.6	20.0	78	78 - 123	17	30
n-Butanol	1110	1000	111	986	1000	99	70 - 130	12	30
2-Butanone (MEK)	20.8	20.0	104	19.6	20.0	98	60 - 133	6	30
2-Hexanone	15.8	20.0	79	16.1	20.0	80	61 - 131	1	30
4-Methyl-2-pentanone	18.0	20.0	90	18.1	20.0	90	61 - 132	<1	30
Acetone	17.9	20.0	89	19.4	20.0	97	54 - 139	8	30
Benzene	20.6	20.0	103	17.3	20.0	87	78 - 121	17	30
Bromodichloromethane	22.4	20.0	112	19.2	20.0	96	80 - 125	15	30
Bromoform	20.6	20.0	103	18.1	20.0	90	68 - 130	13	30
Bromomethane	17.2	20.0	86	15.9	20.0	79	57 - 144	8	30
Carbon Disulfide	20.4	20.0	102	25.7	20.0	128	52 - 140	23	30
Carbon Tetrachloride	21.1	20.0	105	17.2	20.0	86	68 - 133	20	30
Chlorobenzene	19.3	20.0	96	16.4	20.0	82	80 - 121	16	30
Chloroethane	24.0	20.0	120	19.3	20.0	96	71 - 130	22	30
Chloroform	23.1	20.0	116	19.5	20.0	97	78 - 125	17	30
Chloromethane	21.7	20.0	108	17.9	20.0	89	61 - 138	19	30
Cyclohexane	21.5	20.0	108	21.2	20.0	106	57 - 126	2	30
Dibromochloromethane	20.7	20.0	104	17.7	20.0	88	78 - 133	16	30
Dichlorodifluoromethane (CFC 12)	21.4	20.0	107	17.2	20.0	86	45 - 159	22	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/29/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 259408

Analyte Name	Lab Control Sample RQ1108651-02			Duplicate Lab Control Sample RQ1108651-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	22.4	20.0	112	19.1	20.0	96	75 - 125	16	30
Ethylbenzene	19.5	20.0	97	16.3	20.0	82	78 - 123	18	30
Isopropylbenzene (Cumene)	22.0	20.0	110	17.6	20.0	88	73 - 133	22	30
Methyl Acetate	23.1	20.0	115	22.4	20.0	112	57 - 157	3	30
Methyl tert-Butyl Ether	21.4	20.0	107	18.7	20.0	93	75 - 126	14	30
Methylcyclohexane	22.1	20.0	111	21.9	20.0	110	61 - 125	<1	30
Styrene	21.1	20.0	106	17.4	20.0	87	80 - 132	19	30
Tetrachloroethene (PCE)	19.0	20.0	95	15.9	20.0	79	72 - 131	18	30
Toluene	20.9	20.0	105	17.4	20.0	87	78 - 122	18	30
Trichloroethene (TCE)	20.4	20.0	102	17.2	20.0	86	74 - 127	17	30
Trichlorofluoromethane (CFC 11)	23.9	20.0	119	19.8	20.0	99	69 - 141	18	30
Vinyl Chloride	23.8	20.0	119	19.3	20.0	97	72 - 138	21	30
cis-1,2-Dichloroethene	22.4	20.0	112	18.9	20.0	94	78 - 122	17	30
cis-1,3-Dichloropropene	20.6	20.0	103	17.7	20.0	89	77 - 125	15	30
m,p-Xylenes	41.1	40.0	103	34.0	40.0	85	79 - 126	19	30
n-Butyl Acetate	17.1	20.0	86	16.4	20.0	82	31 - 144	4	30
o-Xylene	20.4	20.0	102	17.2	20.0	86	77 - 118	17	30
trans-1,2-Dichloroethene	21.9	20.0	110	18.1	20.0	91	75 - 121	19	30
trans-1,3-Dichloropropene	20.5	20.0	103	17.8	20.0	89	69 - 127	14	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 #TR0272
 Sample Matrix: Water

Service Request: R1104782
 Date Analyzed: 8/30/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 259593

Lab Control Sample
 RQ1108621-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.9	20.0	90	72 - 128
1,1,2,2-Tetrachloroethane	19.6	20.0	98	72 - 131
1,1,2-Trichloroethane	18.8	20.0	94	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.2	20.0	91	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.9	20.0	95	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.6	20.0	88	72 - 129
1,2,4-Trichlorobenzene	18.1	20.0	90	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	19.6	20.0	98	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	20.0	20.0	100	73 - 127
1,2-Dichloropropane	19.6	20.0	98	80 - 123
1,3-Dichlorobenzene	18.4	20.0	92	78 - 124
1,4-Dichlorobenzene	18.2	20.0	91	78 - 123
n-Butanol	1040	1000	104	70 - 130
2-Butanone (MEK)	19.5	20.0	97	60 - 133
2-Hexanone	17.3	20.0	86	61 - 131
4-Methyl-2-pentanone	18.1	20.0	90	61 - 132
Acetone	16.9	20.0	85	54 - 139
Benzene	17.8	20.0	89	78 - 121
Bromodichloromethane	20.0	20.0	100	80 - 125
Bromoform	20.2	20.0	101	68 - 130
Bromomethane	16.6	20.0	83	57 - 144
Carbon Disulfide	23.0	20.0	115	52 - 140
Carbon Tetrachloride	18.1	20.0	91	68 - 133
Chlorobenzene	18.3	20.0	92	80 - 121
Chloroethane	20.4	20.0	102	71 - 130
Chloroform	19.8	20.0	99	78 - 125
Chloromethane	17.8	20.0	89	61 - 138
Cyclohexane	20.3	20.0	101	57 - 126
Dibromochloromethane	20.1	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	16.8	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/30/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 259593

**Lab Control Sample
 RQ1108621-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.1	20.0	96	75 - 125
Ethylbenzene	18.5	20.0	92	78 - 123
Isopropylbenzene (Cumene)	20.0	20.0	100	73 - 133
Methyl Acetate	21.0	20.0	105	57 - 157
Methyl tert-Butyl Ether	18.5	20.0	92	75 - 126
Methylcyclohexane	20.6	20.0	103	61 - 125
Styrene	19.8	20.0	99	80 - 132
Tetrachloroethene (PCE)	17.4	20.0	87	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	17.6	20.0	88	74 - 127
Trichlorofluoromethane (CFC 11)	19.8	20.0	99	69 - 141
Vinyl Chloride	19.8	20.0	99	72 - 138
cis-1,2-Dichloroethene	18.9	20.0	95	78 - 122
cis-1,3-Dichloropropene	18.1	20.0	91	77 - 125
m,p-Xylenes	38.3	40.0	96	79 - 126
n-Butyl Acetate	16.9	20.0	84	31 - 144
o-Xylene	19.0	20.0	95	77 - 118
trans-1,2-Dichloroethene	18.2	20.0	91	75 - 121
trans-1,3-Dichloropropene	17.8	20.0	89	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 9/ 2/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 260455

Lab Control Sample
RQ1108845-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	28.9	26.1	111	56 - 148
Ethene	24.7	24.3	101	58 - 155
Methane	28.0	26.2	107	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 #TR0272
Sample Matrix: Water

Service Request: R1104782
Date Analyzed: 8/30/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 259784

Analyte Name	Lab Control Sample RQ1108668-02			Duplicate Lab Control Sample RQ1108668-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.19	1.00	119	1.17	1.00	117	70 - 130	2	30
Acetic Acid	9.91	10.0	99	9.80	10.0	98	70 - 135	1	30
Butanoic Acid (Butyric Acid)	10.4	10.0	104	10.2	10.0	102	78 - 113	2	30
Lactic Acid	9.42	9.97	94	9.31	9.97	93	61 - 109	1	30
Propionic Acid	9.86	9.97	99	9.72	9.97	98	80 - 125	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:
 Sampler's Signature: [Signature]


Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-2011 0824	08/24/11	1108	001, 002	W
LC34-RW0008-052.0-2011 0824	08/24/11	1150	-003, 004	W
LC34-TB-2011 0824	NA	NA	-005	W

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
15	3	2	1	3	1	3	1	1	
15	3	2	1	3	1	3	1	1	
3	3								

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:
 Invoice Information
 P.O. #
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 Please filter dissolved metals in lab.

R1104782
 GeoSyntec Consultants
 ESTCP PED LC34 #TR0272


RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Josiah Bortner
 Firm: Geosyntec
 Date/Time: 08/25/11 1030

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Lafors
 Firm: CAS
 Date/Time: 9/26/11 1010

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:
 Invoice Information
 P.O. #
 Bill to: TR0272

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Josiah Bortner
 Firm: Geosyntec
 Date/Time: 08/25/11 1030

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Lafors
 Firm: CAS
 Date/Time: 9/26/11 1010

Cooler Receipt And Preservation Check Form

Project/Client Sevanteo Folder Number R1104782

Cooler received on 8/26/11 by: AD COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES (NO)
2. Were custody papers properly filled out (ink, signed, etc.)? YES (NO)
3. Did all bottles arrive in good condition (unbroken)? YES (NO)
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES (NO) N/A *# 1 RSK-175 vial*
5. Were Ice or Ice packs present? YES (NO) *10x*
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 4.8°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 8/26/11 1025
 Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 8/26/11

Cooler Breakdown: Date: 8/26/11 Time: 1130 by: AD

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES (NO)
2. Did all bottle labels and tags agree with custody papers? YES (NO)
3. Were correct containers used for the tests indicated? YES (NO)
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			<u>WC103098C</u>	<u>2/16</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC103138D</u>	<u>8/12</u>				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103098C</u>	<u>5/16</u>				
	HCl	*	*	<u>H 11 0020</u>	<u>7/12</u>				

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 1-087-002, 072511-22D, 1-045-004
 Other Comments: _____

H₃PO₄ Lot # WC103104G Exp. 8/12

PC Secondary Review: KB 9/14/11
 H:\SMODOCS\Cooler Receipt 3.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

September 23, 2011

Service Request No: R1104862

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272 8/30/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on September 1, 2011. For your reference, these analyses have been assigned our service request number **R1104862**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Karen Bunker

Karen Bunker
Project Manager

Page 1 of 39

Client: Geosyntec
Project: ESTCP PED LC34/ TR0272
Sample Matrix: Water

Service Request No.: R1104862
Date Received: 9/1/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples and one (1) Trip Blank were collected by the client on 8/31/11 and were received for analysis at Columbia Analytical Services on 9/1/11 via a national courier. The samples were received at a cooler temperature of 3.9°C within the guidelines of 0-6°C.

Organic Compounds

Two (2) water samples and one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C, Organic Acids by HPLC and Method RSK-175 by GC. Samples were merged per client request for reporting.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except the Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Bromomethane and Acetone on the 9/2/11 analytical run. All detected concentrations for these compounds in samples associated with these CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

The Laboratory Control Samples (LCS) and LCS Duplicate (RSK & Organic Acids) recoveries were all within QC limits.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

Both samples had hits above the calibration range of the standards for Methane. The samples are then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were initially analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. The RSK-175 samples were analyzed within 14 days of collection for preserved samples. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for Anions: Chloride, Nitrate, Nitrite, Bromide, Iodide and Sulfate by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F. The soluble metals were filtered in the laboratory upon receipt of the samples.

Approved by Blatten Date 9/23/11

00002

All initial and continuing calibration criteria were met for these analyses with the exception of the middle CCV for Nitrate (CCV2) on 9/1/11. All Nitrate samples were repeated outside of the 48 hour method specified holding time and have been flagged with a “*”. Both sets of data have been reported.

All Laboratory Control Sample (LCS) recoveries were within QC limits.

Nitrite samples were analyzed at a dilution due to high Chloride concentrations which caused interferences and have been reported with high non-detects.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analyses of these samples.

Approved by *Van* Date 9/23/11

CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1104862

<u>Lab ID</u>	<u>Client ID</u>
R1104862-001	L34-RW0007-038.5-20110831
R1104862-002	L34-RW0007-038.5-20110831 Dissolved
R1104862-003	L34-RW0008-052.0-20110831
R1104862-004	L34-RW0008-052.0-20110831 Dissolved
R1104862-005	LC34-TB-20110831

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0007-038.5-20110831
Lab Code: R1104862-001

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/1/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	472	mg/L	2.0	1	NA	9/2/11 07:40	
Bromide	300.0	17.5	mg/L	1.0	10	NA	9/1/11 18:22	
Carbon, Total Organic (TOC), Average	9060A	280	mg/L	30	30	NA	9/2/11 20:21	
Chloride	300.0	487	mg/L	20	100	NA	9/1/11 18:49	
Iodide	300.0	11.2	mg/L	2.0	10	NA	9/1/11 14:37	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/1/11 18:22	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	9/1/11 18:49	
Sulfate	300.0	2.3	mg/L	2.0	10	NA	9/6/11 21:03	
Sulfide, Total	SM 4500-S2- F	22.6	mg/L	0.98	1	NA	9/2/11 11:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0007-038.5-20110831
Lab Code: R1104862-001
Run Type: Reanalysis

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/1/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/6/11 21:03	*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0007-038.5-20110831 Dissolved
Lab Code: R1104862-002

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/1/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	9/6/11	9/22/11 02:02	
Iron, Dissolved	6010C	200	µg/L	100	1	9/6/11	9/22/11 02:02	
Manganese, Dissolved	6010C	23	µg/L	10	1	9/6/11	9/22/11 02:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/30/11
 Sample Matrix: Water
 Sample Name: L34-RW0007-038.5-20110831
 Lab Code: R1104862-001

Service Request: R1104862
 Date Collected: 8/31/11 1009
 Date Received: 9/1/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	9/2/11 13:52		260182	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,1,2-Trichloroethane	500	U	500	23	100	NA	9/2/11 13:52		260182	
1,1,2-Trichloro-1,2,2-trifluoroethane	13000		500	31	100	NA	9/2/11 13:52		260182	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	9/2/11 13:52		260182	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	9/2/11 13:52		260182	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	9/2/11 13:52		260182	
1,2-Dibromoethane	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,2-Dichlorobenzene	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,2-Dichloroethane	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,2-Dichloropropane	500	U	500	29	100	NA	9/2/11 13:52		260182	
1,3-Dichlorobenzene	500	U	500	20	100	NA	9/2/11 13:52		260182	
1,4-Dichlorobenzene	500	U	500	20	100	NA	9/2/11 13:52		260182	
n-Butanol	29000		25000	1100	100	NA	9/2/11 13:52		260182	
2-Butanone (MEK)	1000	U	1000	51	100	NA	9/2/11 13:52		260182	
2-Hexanone	1000	U	1000	35	100	NA	9/2/11 13:52		260182	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	9/2/11 13:52		260182	
Acetone	2000	U	2000	98	100	NA	9/2/11 13:52		260182	
Benzene	500	U	500	21	100	NA	9/2/11 13:52		260182	
Bromodichloromethane	500	U	500	20	100	NA	9/2/11 13:52		260182	
Bromoform	500	U	500	27	100	NA	9/2/11 13:52		260182	
Bromomethane	500	U	500	31	100	NA	9/2/11 13:52		260182	
Carbon Disulfide	1000	U	1000	20	100	NA	9/2/11 13:52		260182	
Carbon Tetrachloride	500	U	500	27	100	NA	9/2/11 13:52		260182	
Chlorobenzene	500	U	500	20	100	NA	9/2/11 13:52		260182	
Chloroethane	500	U	500	31	100	NA	9/2/11 13:52		260182	
Chloroform	500	U	500	22	100	NA	9/2/11 13:52		260182	
Chloromethane	500	U	500	24	100	NA	9/2/11 13:52		260182	
Cyclohexane	1000	U	1000	24	100	NA	9/2/11 13:52		260182	
Dibromochloromethane	500	U	500	20	100	NA	9/2/11 13:52		260182	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	9/2/11 13:52		260182	
Dichloromethane	500	U	500	22	100	NA	9/2/11 13:52		260182	
Ethylbenzene	500	U	500	20	100	NA	9/2/11 13:52		260182	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	9/2/11 13:52		260182	
Methyl Acetate	1000	U	1000	23	100	NA	9/2/11 13:52		260182	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0007-038.5-20110831
Lab Code: R1104862-001

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/1/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	500	U	500	20	100	NA	9/2/11 13:52		260182	
Methylcyclohexane	1000	U	1000	25	100	NA	9/2/11 13:52		260182	
Styrene	500	U	500	20	100	NA	9/2/11 13:52		260182	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	9/2/11 13:52		260182	
Toluene	500	U	500	20	100	NA	9/2/11 13:52		260182	
Trichloroethene (TCE)	10000		500	23	100	NA	9/2/11 13:52		260182	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	9/2/11 13:52		260182	
Vinyl Chloride	2000		500	23	100	NA	9/2/11 13:52		260182	
cis-1,2-Dichloroethene	20000		500	20	100	NA	9/2/11 13:52		260182	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	9/2/11 13:52		260182	
m,p-Xylenes	500	U	500	20	100	NA	9/2/11 13:52		260182	
n-Butyl Acetate	500	U	500	21	100	NA	9/2/11 13:52		260182	
o-Xylene	500	U	500	20	100	NA	9/2/11 13:52		260182	
trans-1,2-Dichloroethene	150	J	500	20	100	NA	9/2/11 13:52		260182	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	9/2/11 13:52		260182	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/2/11 13:52	
Dibromofluoromethane	103	89-119	9/2/11 13:52	
Toluene-d8	103	87-121	9/2/11 13:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0007-038.5-20110831
Lab Code: R1104862-001

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/ 1/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	49		1.0	1	NA	9/8/11 10:37		260617	
Ethene	15		1.0	1	NA	9/8/11 10:37		260617	
Methane	150	D	4.0	2	NA	9/8/11 10:49		260617	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Collected: 8/31/11 1009
Date Received: 9/ 1/11
Date Analyzed: 9/2/11 16:50

Sample Name: L34-RW0007-038.5-20110831
Lab Code: R1104862-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\090211\X0006318.D\

Analysis Lot: 260101
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	290	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	310	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	17	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0008-052.0-20110831
Lab Code: R1104862-003

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/ 1/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	329	mg/L	2.0	1	NA	9/2/11 07:40	
Bromide	300.0	5.6	mg/L	1.0	10	NA	9/1/11 18:35	
Carbon, Total Organic (TOC), Average	9060A	122	mg/L	30	30	NA	9/2/11 21:01	
Chloride	300.0	590	mg/L	20	100	NA	9/1/11 19:28	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	9/1/11 14:45	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/1/11 18:35	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	9/1/11 19:28	
Sulfate	300.0	3.7	mg/L	2.0	10	NA	9/6/11 21:16	
Sulfide, Total	SM 4500-S2- F	18.6	mg/L	0.98	1	NA	9/2/11 11:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0008-052.0-20110831
Lab Code: R1104862-003
Run Type: Reanalysis

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/ 1/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/6/11 21:16	*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0008-052.0-20110831 Dissolved
Lab Code: R1104862-004

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/1/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/6/11	9/22/11 02:08	
Iron, Dissolved	6010C	190		µg/L	100	1	9/6/11	9/22/11 02:08	
Manganese, Dissolved	6010C	21		µg/L	10	1	9/6/11	9/22/11 02:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/30/11
 Sample Matrix: Water
 Sample Name: L34-RW0008-052.0-20110831
 Lab Code: R1104862-003

Service Request: R1104862
 Date Collected: 8/31/11 1051
 Date Received: 9/1/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.2	5	NA	9/2/11 15:24		260182	
1,1,2,2-Tetrachloroethane	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,1,2-Trichloroethane	25	U	25	1.2	5	NA	9/2/11 15:24		260182	
1,1,2-Trichloro-1,2,2-trifluoroethane	310		25	1.6	5	NA	9/2/11 15:24		260182	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,1-Dichloroethene (1,1-DCE)	2.1	J	25	1.5	5	NA	9/2/11 15:24		260182	
1,2,4-Trichlorobenzene	25	U	25	1.3	5	NA	9/2/11 15:24		260182	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	5	NA	9/2/11 15:24		260182	
1,2-Dibromoethane	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,2-Dichlorobenzene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,2-Dichloroethane	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,2-Dichloropropane	25	U	25	1.5	5	NA	9/2/11 15:24		260182	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
n-Butanol	1300	U	1300	53	5	NA	9/2/11 15:24		260182	
2-Butanone (MEK)	50	U	50	2.6	5	NA	9/2/11 15:24		260182	
2-Hexanone	50	U	50	1.8	5	NA	9/2/11 15:24		260182	
4-Methyl-2-pentanone	50	U	50	1.4	5	NA	9/2/11 15:24		260182	
Acetone	5.5	J	100	4.9	5	NA	9/2/11 15:24		260182	
Benzene	25	U	25	1.1	5	NA	9/2/11 15:24		260182	
Bromodichloromethane	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Bromoform	25	U	25	1.4	5	NA	9/2/11 15:24		260182	
Bromomethane	25	U	25	1.6	5	NA	9/2/11 15:24		260182	
Carbon Disulfide	50	U	50	1.0	5	NA	9/2/11 15:24		260182	
Carbon Tetrachloride	25	U	25	1.4	5	NA	9/2/11 15:24		260182	
Chlorobenzene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Chloroethane	25	U	25	1.6	5	NA	9/2/11 15:24		260182	
Chloroform	25	U	25	1.1	5	NA	9/2/11 15:24		260182	
Chloromethane	25	U	25	1.2	5	NA	9/2/11 15:24		260182	
Cyclohexane	50	U	50	1.2	5	NA	9/2/11 15:24		260182	
Dibromochloromethane	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	5	NA	9/2/11 15:24		260182	
Dichloromethane	25	U	25	1.1	5	NA	9/2/11 15:24		260182	
Ethylbenzene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Methyl Acetate	50	U	50	1.2	5	NA	9/2/11 15:24		260182	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0008-052.0-20110831
Lab Code: R1104862-003

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/ 1/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Methylcyclohexane	50	U	50	1.3	5	NA	9/2/11 15:24		260182	
Styrene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Toluene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Trichloroethene (TCE)	940		25	1.2	5	NA	9/2/11 15:24		260182	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
Vinyl Chloride	150		25	1.2	5	NA	9/2/11 15:24		260182	
cis-1,2-Dichloroethene	610		25	1.0	5	NA	9/2/11 15:24		260182	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
m,p-Xylenes	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
n-Butyl Acetate	25	U	25	1.1	5	NA	9/2/11 15:24		260182	
o-Xylene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	
trans-1,2-Dichloroethene	3.2	J	25	1.0	5	NA	9/2/11 15:24		260182	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	9/2/11 15:24		260182	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	9/2/11 15:24	
Dibromofluoromethane	104	89-119	9/2/11 15:24	
Toluene-d8	103	87-121	9/2/11 15:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: L34-RW0008-052.0-20110831
Lab Code: R1104862-003

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/1/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	3.8		2.0	2	NA	9/8/11 10:59		260617	
Ethene	23		2.0	2	NA	9/8/11 10:59		260617	
Methane	520	D	20	10	NA	9/8/11 11:12		260617	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Collected: 8/31/11 1051
Date Received: 9/1/11
Date Analyzed: 9/2/11 22:15

Sample Name: L34-RW0008-052.0-20110831
Lab Code: R1104862-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\090211\X0006324.D\

Analysis Lot: 260101
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	210	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	72	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	15	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/30/11
 Sample Matrix: Water
 Sample Name: LC34-TB-20110831
 Lab Code: R1104862-005

Service Request: R1104862
 Date Collected: 8/30/11
 Date Received: 9/1/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	9/2/11 16:24		260182	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	9/2/11 16:24		260182	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	9/2/11 16:24		260182	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	9/2/11 16:24		260182	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	9/2/11 16:24		260182	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	9/2/11 16:24		260182	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	9/2/11 16:24		260182	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
n-Butanol	250	U	250	11	1	NA	9/2/11 16:24		260182	
2-Butanone (MEK)	10	U	10	0.51	1	NA	9/2/11 16:24		260182	
2-Hexanone	10	U	10	0.35	1	NA	9/2/11 16:24		260182	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	9/2/11 16:24		260182	
Acetone	20	U	20	0.98	1	NA	9/2/11 16:24		260182	
Benzene	5.0	U	5.0	0.21	1	NA	9/2/11 16:24		260182	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Bromoform	5.0	U	5.0	0.27	1	NA	9/2/11 16:24		260182	
Bromomethane	5.0	U	5.0	0.31	1	NA	9/2/11 16:24		260182	
Carbon Disulfide	10	U	10	0.20	1	NA	9/2/11 16:24		260182	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	9/2/11 16:24		260182	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Chloroethane	5.0	U	5.0	0.31	1	NA	9/2/11 16:24		260182	
Chloroform	5.0	U	5.0	0.22	1	NA	9/2/11 16:24		260182	
Chloromethane	5.0	U	5.0	0.24	1	NA	9/2/11 16:24		260182	
Cyclohexane	10	U	10	0.24	1	NA	9/2/11 16:24		260182	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	9/2/11 16:24		260182	
Dichloromethane	5.0	U	5.0	0.22	1	NA	9/2/11 16:24		260182	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Methyl Acetate	10	U	10	0.23	1	NA	9/2/11 16:24		260182	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: LC34-TB-20110831
Lab Code: R1104862-005

Service Request: R1104862
Date Collected: 8/30/11
Date Received: 9/ 1/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Methylcyclohexane	10	U	10	0.25	1	NA	9/2/11 16:24		260182	
Styrene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Toluene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	9/2/11 16:24		260182	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	9/2/11 16:24		260182	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	9/2/11 16:24		260182	
o-Xylene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	9/2/11 16:24		260182	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/2/11 16:24	
Dibromofluoromethane	104	89-119	9/2/11 16:24	
Toluene-d8	103	87-121	9/2/11 16:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104862-MB1

Service Request: R1104862
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	9/2/11 07:40	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	9/1/11 17:50	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/2/11 13:53	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	9/1/11 17:50	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	9/1/11 13:38	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/1/11 17:50	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/1/11 17:50	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	9/6/11 16:34	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	9/2/11 11:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104862-MB2

Service Request: R1104862
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Nitrate as Nitrogen	300.0	0.10 U	mg/L	0.10	1	NA	9/6/11 16:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104862-MB1

Service Request: R1104862
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/ 6/11	9/22/11 00:34	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/ 6/11	9/22/11 00:34	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/ 6/11	9/22/11 00:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1104862-MB2

Service Request: R1104862
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/ 6/11	9/22/11 00:39	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/ 6/11	9/22/11 00:39	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/ 6/11	9/22/11 00:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 8/30/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1108840-01

Service Request: R1104862
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	9/2/11 13:11		260182	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	9/2/11 13:11		260182	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	9/2/11 13:11		260182	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	9/2/11 13:11		260182	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	9/2/11 13:11		260182	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	9/2/11 13:11		260182	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	9/2/11 13:11		260182	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
n-Butanol	250	U	250	11	1	NA	9/2/11 13:11		260182	
2-Butanone (MEK)	10	U	10	0.51	1	NA	9/2/11 13:11		260182	
2-Hexanone	10	U	10	0.35	1	NA	9/2/11 13:11		260182	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	9/2/11 13:11		260182	
Acetone	20	U	20	0.98	1	NA	9/2/11 13:11		260182	
Benzene	5.0	U	5.0	0.21	1	NA	9/2/11 13:11		260182	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Bromoform	5.0	U	5.0	0.27	1	NA	9/2/11 13:11		260182	
Bromomethane	5.0	U	5.0	0.31	1	NA	9/2/11 13:11		260182	
Carbon Disulfide	10	U	10	0.20	1	NA	9/2/11 13:11		260182	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	9/2/11 13:11		260182	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Chloroethane	5.0	U	5.0	0.31	1	NA	9/2/11 13:11		260182	
Chloroform	5.0	U	5.0	0.22	1	NA	9/2/11 13:11		260182	
Chloromethane	5.0	U	5.0	0.24	1	NA	9/2/11 13:11		260182	
Cyclohexane	10	U	10	0.24	1	NA	9/2/11 13:11		260182	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	9/2/11 13:11		260182	
Dichloromethane	5.0	U	5.0	0.22	1	NA	9/2/11 13:11		260182	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Methyl Acetate	10	U	10	0.23	1	NA	9/2/11 13:11		260182	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108840-01

Service Request: R1104862
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Methylcyclohexane	10	U	10	0.25	1	NA	9/2/11 13:11		260182	
Styrene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Toluene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	9/2/11 13:11		260182	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	9/2/11 13:11		260182	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	9/2/11 13:11		260182	
o-Xylene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	9/2/11 13:11		260182	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	9/2/11 13:11	
Dibromofluoromethane	102	89-119	9/2/11 13:11	
Toluene-d8	102	87-121	9/2/11 13:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1108890-01

Service Request: R1104862
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	1.0	U	1.0	1	NA	9/8/11 09:43		260617	
Ethene	1.0	U	1.0	1	NA	9/8/11 09:43		260617	
Methane	2.0	U	2.0	1	NA	9/8/11 09:43		260617	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Collected: NA
Date Received: NA
Date Analyzed: 9/2/11 14:31

Sample Name: Method Blank
Lab Code: RQ1108741-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\090211\X0006315.D\

Analysis Lot: 260101
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 2/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104862-LCS1			Duplicate Lab Control Sample R1104862-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.02	4.7	106	4.98	4.7	105	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 1/11 -
 9/ 6/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104862-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.981	1.00	98	90 - 110
Chloride	300.0	1.92	2.00	96	90 - 110
Iodide	300.0	0.971	1.00	97	90 - 110
Nitrate as Nitrogen	300.0	0.949	1.00	95	90 - 110
Sulfate	300.0	2.02	2.00	101	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.0	20.0	95	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117
Nitrite as Nitrogen	300.0	0.974	1.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 6/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1104862-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Nitrate as Nitrogen	300.0	0.999	1.00	100	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/22/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1104862-LCS

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Arsenic, Dissolved	6010C	39.2	40	98	80 - 120	
Iron, Dissolved	6010C	1020	1000	102	80 - 120	
Manganese, Dissolved	6010C	486	500	97	80 - 120	

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 2/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 260182

**Lab Control Sample
 RQ1108840-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.2	20.0	86	72 - 128
1,1,2,2-Tetrachloroethane	19.9	20.0	100	72 - 131
1,1,2-Trichloroethane	18.8	20.0	94	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.0	20.0	85	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.8	20.0	94	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.8	20.0	89	72 - 129
1,2,4-Trichlorobenzene	18.3	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	19.9	20.0	99	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	19.1	20.0	95	73 - 127
1,2-Dichloropropane	19.4	20.0	97	80 - 123
1,3-Dichlorobenzene	18.3	20.0	91	78 - 124
1,4-Dichlorobenzene	18.1	20.0	91	78 - 123
n-Butanol	1020	1000	102	70 - 130
2-Butanone (MEK)	17.7	20.0	89	60 - 133
2-Hexanone	16.9	20.0	84	61 - 131
4-Methyl-2-pentanone	17.1	20.0	85	61 - 132
Acetone	16.6	20.0	83	54 - 139
Benzene	17.8	20.0	89	78 - 121
Bromodichloromethane	18.6	20.0	93	80 - 125
Bromoform	17.7	20.0	88	68 - 130
Bromomethane	15.6	20.0	78	57 - 144
Carbon Disulfide	19.3	20.0	96	52 - 140
Carbon Tetrachloride	16.7	20.0	84	68 - 133
Chlorobenzene	18.4	20.0	92	80 - 121
Chloroethane	19.6	20.0	98	71 - 130
Chloroform	19.2	20.0	96	78 - 125
Chloromethane	17.3	20.0	87	61 - 138
Cyclohexane	15.9	20.0	80	57 - 126
Dibromochloromethane	18.8	20.0	94	78 - 133
Dichlorodifluoromethane (CFC 12)	16.5	20.0	83	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 2/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 260182

**Lab Control Sample
 RQ1108840-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.3	20.0	97	75 - 125
Ethylbenzene	18.6	20.0	93	78 - 123
Isopropylbenzene (Cumene)	20.3	20.0	102	73 - 133
Methyl Acetate	19.8	20.0	99	57 - 157
Methyl tert-Butyl Ether	18.5	20.0	93	75 - 126
Methylcyclohexane	16.3	20.0	81	61 - 125
Styrene	20.0	20.0	100	80 - 132
Tetrachloroethene (PCE)	17.6	20.0	88	72 - 131
Toluene	17.9	20.0	90	78 - 122
Trichloroethene (TCE)	17.7	20.0	88	74 - 127
Trichlorofluoromethane (CFC 11)	17.7	20.0	89	69 - 141
Vinyl Chloride	18.7	20.0	93	72 - 138
cis-1,2-Dichloroethene	18.9	20.0	95	78 - 122
cis-1,3-Dichloropropene	18.3	20.0	92	77 - 125
m,p-Xylenes	38.5	40.0	96	79 - 126
n-Butyl Acetate	17.0	20.0	85	31 - 144
o-Xylene	19.4	20.0	97	77 - 118
trans-1,2-Dichloroethene	18.1	20.0	91	75 - 121
trans-1,3-Dichloropropene	17.7	20.0	89	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 8/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 260617

Lab Control Sample
RQ1108890-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	29.8	26.1	114	56 - 148
Ethene	26.3	24.3	108	58 - 155
Methane	29.8	26.2	114	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 8/30/11
Sample Matrix: Water

Service Request: R1104862
Date Analyzed: 9/ 2/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 260101

Analyte Name	Lab Control Sample RQ1108741-02			Duplicate Lab Control Sample RQ1108741-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.15	1.00	115	1.14	1.00	114	70 - 130	<1	30
Acetic Acid	9.15	10.0	92	9.72	10.0	97	70 - 135	6	30
Butanoic Acid (Butyric Acid)	10.1	10.0	101	10.0	10.0	100	78 - 113	<1	30
Lactic Acid	9.00	9.97	90	9.24	9.97	93	61 - 109	3	30
Propionic Acid	9.69	9.97	97	9.83	9.97	99	80 - 125	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475


Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Analysis Requested

Number of Containers	VOCs (826C) plus n-butyl acetate	VEAs (300)	Bromide and Iodide with Anions (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
15	3	2	1	3	1	3	1	1	
15	3	2	1	3	1	3	1	1	
3	3								

Comments/Special Instructions:
 Please filter dissolved metals in lab.

R1104862
 Geosyntec Consultants
 ESTCP PED LC34 TR0272 8/30/11



TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Bonatelli
 Firm: Geosyntec Consultants
 Date/Time: 08/30/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Bonatelli
 Firm: Geosyntec Consultants
 Date/Time: 08/30/11 - 1630

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Bonatelli
 Firm: Geosyntec Consultants
 Date/Time: 08/30/11 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Bonatelli
 Firm: Geosyntec Consultants
 Date/Time: 08/30/11 - 1630

Cooler Receipt And Preservation Check Form

Project/Client Geosyntec Folder Number R1104802

Cooler received on 9/1/11 by: dfw COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES ~~NO~~ N/A
5. Were ~~Ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? CAS/RGC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.9°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 9/1/11 / 1028

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: Temp Blank / ~~Sample Bottle~~

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 9/1/11

Cooler Breakdown: Date: 9/1/11 Time: 1216 by: dfw

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	Lot Received		Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO					
≥12	NaOH							
≤2	HNO ₃							
≤2	H ₂ SO ₄							
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid				
	Na ₂ S ₂ O ₃	-	-					*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet
	Zn Aceta	-	-					
	HCl	*	*	<u>416020</u>	<u>712</u>			

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 1-045-004, 072511-200, 1087-002

Other Comments: _____

PC Secondary Review: Nathan

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

October 03, 2011

Service Request No: R1105169

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 9/15/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on September 16, 2011. For your reference, these analyses have been assigned our service request number **R1105169**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 35

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 9/15/11
Sample Matrix: Water

Service Request No.: R1105169
Date Received: 9/16/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 9/15/11 and were received for analysis at Columbia Analytical Services on 9/16/11 via a national courier. The samples were received at a cooler temperature of 0.8°C within the guidelines of 0-6°C.

Organic Compounds

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) (RSK & Organic Acids) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. Subsequent hits on the dilution are flagged as "D". The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "J", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All LCS and LCSD (Sulfide) recoveries were within QC limits.

Approved by Keon Beender Date 10/4/11

All samples were initially analyzed within holding times for these analyses. The Nitrite analysis was repeated almost 2 hours outside of the 48 hour holding time due to an interfering Chloride peak on the initial analysis. Only the reanalysis date has been reported. The data has been flagged as "*".

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by Karen J. Bender Date 10/4/11

CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1105169

<u>Lab ID</u>	<u>Client ID</u>
R1105169-001	LC34-RW0007-038.5-2011091511
R1105169-002	LC34-RW0007-038.5-2011091511 Dissolved
R1105169-003	LC34-RW0008-052.0-20110915
R1105169-004	LC34-RW0008-052.0-20110915 Dissolved

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-2011091511
Lab Code: R1105169-001

Service Request: R1105169
Date Collected: 9/15/11 1245
Date Received: 9/16/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	445	mg/L	2.0	1	NA	9/26/11 10:00	
Bromide	300.0	12.9	mg/L	1.0	10	NA	9/16/11 17:05	
Carbon, Total Organic (TOC), Average	9060A	219	mg/L	30	30	NA	9/19/11 14:58	
Chloride	300.0	512	mg/L	20	100	NA	9/17/11 14:37	
Iodide	300.0	10.3	mg/L	2.0	10	NA	9/22/11 12:26	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/16/11 17:05	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	9/17/11 14:37	*
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	9/16/11 17:05	
Sulfide, Total	SM 4500-S2- F	21.1	mg/L	1.0	1	NA	9/20/11 18:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-2011091511 Dissolved
Lab Code: R1105169-002

Service Request: R1105169
Date Collected: 9/15/11 1245
Date Received: 9/16/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	9/19/11	9/25/11 13:19	
Iron, Dissolved	6010C	100 U	µg/L	100	1	9/19/11	9/26/11 18:33	
Manganese, Dissolved	6010C	23	µg/L	10	1	9/19/11	9/25/11 13:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 9/15/11
 Sample Matrix: Water

Service Request: R1105169
 Date Collected: 9/15/11 1245
 Date Received: 9/16/11
 Date Analyzed: 9/20/11 19:15

Sample Name: LC34-RW0007-038.5-2011091511
 Lab Code: R1105169-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\092011\D4909.D\

Analysis Lot: 262130
 Instrument Name: R-MS-10
 Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	20	
79-00-5	1,1,2-Trichloroethane	500	U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	14000		500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	57	J	500	29	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	
106-93-4	1,2-Dibromoethane	500	U	500	20	
95-50-1	1,2-Dichlorobenzene	500	U	500	20	
107-06-2	1,2-Dichloroethane	500	U	500	20	
78-87-5	1,2-Dichloropropane	500	U	500	29	
541-73-1	1,3-Dichlorobenzene	500	U	500	20	
106-46-7	1,4-Dichlorobenzene	500	U	500	20	
71-36-3	n-Butanol	25000	U	25000	1100	
78-93-3	2-Butanone (MEK)	1000	U	1000	51	
591-78-6	2-Hexanone	1000	U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	27	
67-64-1	Acetone	2000	U	2000	98	
71-43-2	Benzene	500	U	500	21	
75-27-4	Bromodichloromethane	500	U	500	20	
75-25-2	Bromoform	500	U	500	27	
74-83-9	Bromomethane	500	U	500	31	
75-15-0	Carbon Disulfide	1000	U	1000	20	
56-23-5	Carbon Tetrachloride	500	U	500	27	
108-90-7	Chlorobenzene	500	U	500	20	
75-00-3	Chloroethane	500	U	500	31	
67-66-3	Chloroform	81	J	500	22	
74-87-3	Chloromethane	500	U	500	24	
110-82-7	Cyclohexane	1000	U	1000	24	
124-48-1	Dibromochloromethane	500	U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	57	
75-09-2	Dichloromethane	500	U	500	22	
100-41-4	Ethylbenzene	500	U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: 9/15/11 1245
Date Received: 9/16/11
Date Analyzed: 9/20/11 19:15

Sample Name: LC34-RW0007-038.5-2011091511
Lab Code: R1105169-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\092011\D4909.D\

Analysis Lot: 262130
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	8400		500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	3100		500	23	
156-59-2	cis-1,2-Dichloroethene	19000		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	500	U	500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	150	J	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/20/11 19:15	
Dibromofluoromethane	109	89-119	9/20/11 19:15	
Toluene-d8	103	87-121	9/20/11 19:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-2011091511
Lab Code: R1105169-001

Service Request: R1105169
Date Collected: 9/15/11 1245
Date Received: 9/16/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	48		1.0	1	NA	9/23/11 11:03		262654	
Ethene	33		1.0	1	NA	9/23/11 11:03		262654	
Methane	290	D	10	5	NA	9/23/11 11:15		262654	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: 9/15/11 1245
Date Received: 9/16/11
Date Analyzed: 9/23/11 21:02

Sample Name: LC34-RW0007-038.5-2011091511
Lab Code: R1105169-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\092311\X0006390.D\

Analysis Lot: 262775
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	250	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	250	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	16	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110915
Lab Code: R1105169-003

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	299		mg/L	2.0	1	NA	9/26/11 10:00	
Bromide	300.0	4.8		mg/L	1.0	10	NA	9/16/11 17:31	
Carbon, Total Organic (TOC), Average	9060A	80		mg/L	10	10	NA	9/19/11 15:38	
Chloride	300.0	609		mg/L	20	100	NA	9/17/11 14:50	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	9/22/11 12:34	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	9/16/11 17:31	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	9/17/11 14:50	*
Sulfate	300.0	17.4		mg/L	2.0	10	NA	9/16/11 17:31	
Sulfide, Total	SM 4500-S2- F	15.4		mg/L	1.0	1	NA	9/20/11 18:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110915 Dissolved
Lab Code: R1105169-004

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/19/11	9/25/11 13:25	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/19/11	9/26/11 18:39	
Manganese, Dissolved	6010C	16		µg/L	10	1	9/19/11	9/25/11 13:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11
Date Analyzed: 9/20/11 19:45

Sample Name: LC34-RW0008-052.0-20110915
Lab Code: R1105169-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\092011\D4910.D\

Analysis Lot: 262130
Instrument Name: R-MS-10
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	25	U	25	1.2	
79-34-5	1,1,2,2-Tetrachloroethane	25	U	25	1.0	
79-00-5	1,1,2-Trichloroethane	25	U	25	1.2	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	470		25	1.6	
75-34-3	1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	25	U	25	1.5	
120-82-1	1,2,4-Trichlorobenzene	25	U	25	1.3	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	
106-93-4	1,2-Dibromoethane	25	U	25	1.0	
95-50-1	1,2-Dichlorobenzene	25	U	25	1.0	
107-06-2	1,2-Dichloroethane	25	U	25	1.0	
78-87-5	1,2-Dichloropropane	25	U	25	1.5	
541-73-1	1,3-Dichlorobenzene	25	U	25	1.0	
106-46-7	1,4-Dichlorobenzene	25	U	25	1.0	
71-36-3	n-Butanol	1300	U	1300	53	
78-93-3	2-Butanone (MEK)	50	U	50	2.6	
591-78-6	2-Hexanone	50	U	50	1.8	
108-10-1	4-Methyl-2-pentanone	50	U	50	1.4	
67-64-1	Acetone	100	U	100	4.9	
71-43-2	Benzene	25	U	25	1.1	
75-27-4	Bromodichloromethane	25	U	25	1.0	
75-25-2	Bromoform	25	U	25	1.4	
74-83-9	Bromomethane	25	U	25	1.6	
75-15-0	Carbon Disulfide	50	U	50	1.0	
56-23-5	Carbon Tetrachloride	25	U	25	1.4	
108-90-7	Chlorobenzene	25	U	25	1.0	
75-00-3	Chloroethane	25	U	25	1.6	
67-66-3	Chloroform	1.6	J	25	1.1	
74-87-3	Chloromethane	25	U	25	1.2	
110-82-7	Cyclohexane	50	U	50	1.2	
124-48-1	Dibromochloromethane	25	U	25	1.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	
75-09-2	Dichloromethane	25	U	25	1.1	
100-41-4	Ethylbenzene	25	U	25	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11
Date Analyzed: 9/20/11 19:45

Sample Name: LC34-RW0008-052.0-20110915
Lab Code: R1105169-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\092011\D4910.D\

Analysis Lot: 262130
Instrument Name: R-MS-10
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	25	U	25	1.0	
79-20-9	Methyl Acetate	50	U	50	1.2	
1634-04-4	Methyl tert-Butyl Ether	25	U	25	1.0	
108-87-2	Methylcyclohexane	50	U	50	1.3	
100-42-5	Styrene	25	U	25	1.0	
127-18-4	Tetrachloroethene (PCE)	25	U	25	1.0	
108-88-3	Toluene	25	U	25	1.0	
79-01-6	Trichloroethene (TCE)	970		25	1.2	
75-69-4	Trichlorofluoromethane (CFC 11)	25	U	25	1.0	
75-01-4	Vinyl Chloride	310		25	1.2	
156-59-2	cis-1,2-Dichloroethene	860		25	1.0	
10061-01-5	cis-1,3-Dichloropropene	25	U	25	1.0	
179601-23-1	m,p-Xylenes	25	U	25	1.0	
123-86-4	n-Butyl Acetate	25	U	25	1.1	
95-47-6	o-Xylene	25	U	25	1.0	
156-60-5	trans-1,2-Dichloroethene	5.4	J	25	1.0	
10061-02-6	trans-1,3-Dichloropropene	25	U	25	1.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	9/20/11 19:45	
Dibromofluoromethane	109	89-119	9/20/11 19:45	
Toluene-d8	104	87-121	9/20/11 19:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110915
Lab Code: R1105169-003

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	4.4		2.0	2	NA	9/23/11 11:31		262654	
Ethene	26		2.0	2	NA	9/23/11 11:31		262654	
Methane	430	D	10	5	NA	9/23/11 11:44		262654	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: 9/15/11 1323
Date Received: 9/16/11
Date Analyzed: 9/26/11 17:46

Sample Name: LC34-RW0008-052.0-20110915
Lab Code: R1105169-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\092611\X0006433.D\

Analysis Lot: 262932
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	140		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	34		2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	5.1		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105169-MB

Service Request: R1105169
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	9/26/11 10:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	9/16/11 16:39	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/19/11 13:39	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	9/17/11 14:11	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	9/22/11 12:09	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/16/11 16:39	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/17/11 14:11	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	9/16/11 16:39	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	9/20/11 18:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105169-MB1

Service Request: R1105169
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/19/11	9/25/11 10:18	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/19/11	9/26/11 15:52	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/19/11	9/25/11 10:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105169-MB2

Service Request: R1105169
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	9/19/11	9/25/11 10:29	
Iron, Dissolved	6010C	100	U	µg/L	100	1	9/19/11	9/26/11 15:56	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	9/19/11	9/25/11 10:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 9/15/11
 Sample Matrix: Water

Service Request: R1105169
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 9/20/11 14:46

Sample Name: Method Blank
 Lab Code: RQ1109417-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\092011\VD4900.D\

Analysis Lot: 262130
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	20 U	20	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: NA
Date Received: NA
Date Analyzed: 9/20/11 14:46

Sample Name: Method Blank
Lab Code: RQ1109417-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\092011\D4900.D\

Analysis Lot: 262130
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/20/11 14:46	
Dibromofluoromethane	105	89-119	9/20/11 14:46	
Toluene-d8	103	87-121	9/20/11 14:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: NA
Date Received: NA
Date Analyzed: 9/23/11 10:02

Sample Name: Method Blank
Lab Code: RQ1109498-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star143.run

Analysis Lot: 262654
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	2.0	U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: NA
Date Received: NA
Date Analyzed: 9/23/11 12:15

Sample Name: Method Blank
Lab Code: RQ1109522-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\092311\X0006380.D\

Analysis Lot: 262775
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Collected: NA
Date Received: NA
Date Analyzed: 9/26/11 12:40

Sample Name: Method Blank
Lab Code: RQ1109561-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\092611\X0006427.D\

Analysis Lot: 262932
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/20/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105169-LCSI			Duplicate Lab Control Sample R1105169-DLCSI			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	8.38	8.5	99	8.69	8.5	103	56 - 138	4	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/16/11 -
 9/26/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105169-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.02	1.00	102	90 - 110
Chloride	300.0	2.02	2.00	101	90 - 110
Iodide	300.0	0.953	1.00	95	90 - 110
Nitrate as Nitrogen	300.0	0.993	1.00	99	90 - 110
Sulfate	300.0	1.94	2.00	97	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.9	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.3	10.0	103	86 - 117
Nitrite as Nitrogen	300.0	1.02	1.0	102	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/25/11 -
9/26/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1105169-LCS

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Arsenic, Dissolved	6010C	39.7	40	99	80 - 120	
Iron, Dissolved	6010C	1030	1000	103	80 - 120	
Manganese, Dissolved	6010C	513	500	103	80 - 120	

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/20/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 262130

Analyte Name	Lab Control Sample RQ1109417-02			Duplicate Lab Control Sample RQ1109417-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	19.5	20.0	97	19.9	20.0	100	72 - 128	2	30
1,1,2,2-Tetrachloroethane	19.4	20.0	97	19.3	20.0	97	72 - 131	<1	30
1,1,2-Trichloroethane	19.9	20.0	99	20.0	20.0	100	80 - 122	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	18.1	20.0	90	19.1	20.0	96	68 - 136	6	30
1,1-Dichloroethane (1,1-DCA)	19.4	20.0	97	20.0	20.0	100	76 - 124	3	30
1,1-Dichloroethene (1,1-DCE)	18.9	20.0	95	19.0	20.0	95	72 - 129	<1	30
1,2,4-Trichlorobenzene	19.5	20.0	97	18.9	20.0	95	70 - 133	3	30
1,2-Dibromo-3-chloropropane (DBCP)	17.5	20.0	88	17.1	20.0	85	62 - 131	2	30
1,2-Dibromoethane	19.8	20.0	99	20.7	20.0	104	78 - 125	5	30
1,2-Dichlorobenzene	20.2	20.0	101	20.4	20.0	102	79 - 124	<1	30
1,2-Dichloroethane	19.7	20.0	99	20.2	20.0	101	73 - 127	2	30
1,2-Dichloropropane	19.7	20.0	98	20.5	20.0	103	80 - 123	4	30
1,3-Dichlorobenzene	19.7	20.0	99	19.8	20.0	99	78 - 124	<1	30
1,4-Dichlorobenzene	19.6	20.0	98	19.6	20.0	98	78 - 123	<1	30
n-Butanol	951	1000	95	962	1000	96	70 - 130	1	30
2-Butanone (MEK)	17.4	20.0	87	17.9	20.0	90	60 - 133	3	30
2-Hexanone	15.5	20.0	77	15.9	20.0	79	61 - 131	3	30
4-Methyl-2-pentanone	16.3	20.0	81	17.3	20.0	86	61 - 132	6	30
Acetone	18.2	20.0	91	17.4	20.0	87	54 - 139	4	30
Benzene	19.1	20.0	96	19.7	20.0	98	78 - 121	3	30
Bromodichloromethane	20.3	20.0	102	20.9	20.0	105	80 - 125	3	30
Bromoform	19.7	20.0	98	20.6	20.0	103	68 - 130	5	30
Bromomethane	18.4	20.0	92	18.5	20.0	92	57 - 144	<1	30
Carbon Disulfide	22.4	20.0	112	23.1	20.0	116	52 - 140	3	30
Carbon Tetrachloride	19.7	20.0	99	20.3	20.0	101	68 - 133	3	30
Chlorobenzene	19.7	20.0	98	20.4	20.0	102	80 - 121	4	30
Chloroethane	20.0	20.0	100	20.3	20.0	101	71 - 130	1	30
Chloroform	20.8	20.0	104	21.2	20.0	106	78 - 125	2	30
Chloromethane	16.7	20.0	83	17.1	20.0	85	61 - 138	2	30
Cyclohexane	17.4	20.0	87	17.9	20.0	90	57 - 126	3	30
Dibromochloromethane	20.2	20.0	101	21.2	20.0	106	78 - 133	5	30
Dichlorodifluoromethane (CFC 12)	14.4	20.0	72	15.3	20.0	77	45 - 159	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/20/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 262130

Analyte Name	Lab Control Sample RQ1109417-02			Duplicate Lab Control Sample RQ1109417-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	19.9	20.0	99	20.2	20.0	101	75 - 125	2	30
Ethylbenzene	20.2	20.0	101	20.7	20.0	104	78 - 123	3	30
Isopropylbenzene (Cumene)	21.9	20.0	109	22.8	20.0	114	73 - 133	4	30
Methyl Acetate	18.9	20.0	94	19.5	20.0	97	57 - 157	3	30
Methyl tert-Butyl Ether	18.0	20.0	90	18.8	20.0	94	75 - 126	4	30
Methylcyclohexane	18.2	20.0	91	19.0	20.0	95	61 - 125	5	30
Styrene	21.4	20.0	107	22.1	20.0	111	80 - 132	3	30
Tetrachloroethene (PCE)	19.9	20.0	100	20.2	20.0	101	72 - 131	1	30
Toluene	19.7	20.0	98	20.2	20.0	101	78 - 122	3	30
Trichloroethene (TCE)	19.8	20.0	99	20.4	20.0	102	74 - 127	3	30
Trichlorofluoromethane (CFC 11)	19.8	20.0	99	20.8	20.0	104	69 - 141	5	30
Vinyl Chloride	19.1	20.0	95	19.7	20.0	98	72 - 138	3	30
cis-1,2-Dichloroethene	19.8	20.0	99	20.8	20.0	104	78 - 122	5	30
cis-1,3-Dichloropropene	18.9	20.0	95	19.5	20.0	97	77 - 125	3	30
m,p-Xylenes	41.9	40.0	105	43.5	40.0	109	79 - 126	4	30
n-Butyl Acetate	14.9	20.0	75	16.1	20.0	80	31 - 144	7	30
o-Xylene	20.5	20.0	102	21.3	20.0	106	77 - 118	4	30
trans-1,2-Dichloroethene	20.0	20.0	100	20.3	20.0	102	75 - 121	2	30
trans-1,3-Dichloropropene	18.2	20.0	91	19.0	20.0	95	69 - 127	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/23/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 262654

Analyte Name	Lab Control Sample RQ1109498-02			Duplicate Lab Control Sample RQ1109498-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	28.0	26.0	108	26.8	26.0	103	56 - 148	4	30
Ethene	25.1	24.3	103	24.2	24.3	100	58 - 155	4	30
Methane	28.8	26.2	110	27.7	26.2	106	55 - 150	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/23/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 262775

Analyte Name	Lab Control Sample RQ1109522-02			Duplicate Lab Control Sample RQ1109522-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.08	1.00	108	1.12	1.00	112	70 - 130	4	30
Acetic Acid	10.3	10.0	103	10.5	10.0	105	70 - 135	1	30
Butanoic Acid (Butyric Acid)	10.3	10.0	103	10.2	10.0	102	78 - 113	1	30
Lactic Acid	8.86	9.97	89	8.98	9.97	90	61 - 109	1	30
Propionic Acid	9.48	9.97	95	10.6	9.97	107	80 - 125	12	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/15/11
Sample Matrix: Water

Service Request: R1105169
Date Analyzed: 9/26/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA
Analysis Lot: 262932

Analyte Name	Lab Control Sample RQ1109561-02			Duplicate Lab Control Sample RQ1109561-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.03	1.00	103	1.03	1.00	103	70 - 130	<1	30
Acetic Acid	9.93	10.0	99	9.99	10.0	100	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.99	10.0	100	9.56	10.0	96	78 - 113	4	30
Lactic Acid	8.72	9.97	87	8.74	9.97	88	61 - 109	<1	30
Propionic Acid	9.29	9.97	93	9.31	9.97	93	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (906A)	Sulfide (906A)	MEES (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-2011	09/15/11	12:45	001002	W	15	3	2	1	3	1	3	1	1	
LC34-RW0008-052.0-2011	09/15/11	13:23	0025004	W	15	3	2	1	3	1	3	1	1	
LC34-RW0011-038														

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration)
 Summaries
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration)
 Summaries
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration)
 Summaries
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration)
 Summaries
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

R1105169
 Geosyntec Consultants
 ESTCP PED LC34 9/16/11



RECEIVED BY:
 Signature: [Signature]
 Printed Name: Daniel Ward
 Firm: CAS
 Date/Time: 9/16/11 0955

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 09/15/11 1630

Cooler Receipt And Preservation Check Form

Project/Client Geosyntec-FZ Folder Number R1105169

Cooler received on 9/16/11 by: DPW COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES ~~NO~~
2. Were custody papers properly filled out (ink, signed, etc.)? ~~YES~~ NO
3. Did all bottles arrive in good condition (unbroken)? ~~YES~~ NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES ~~NO~~ N/A
5. Were ~~Ice~~ or Ice packs present? ~~YES~~ NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 0.8°

Is the temperature within 0° - 6° C?: ~~Yes~~ Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 9/16/11 / 0957

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 9/16/11

Cooler Breakdown: Date: 9/16/11 Time: 1138 by: DPW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? ~~YES~~ NO
 2. Did all bottle labels and tags agree with custody papers? ~~YES~~ NO
 3. Were correct containers used for the tests indicated? ~~YES~~ NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			WC103051F	2/16				
≤2	HNO ₃								
≤2	H ₂ SO ₄			WC103138D	8/12				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	WC103098C	5/12				
	HCl	*	*	4110070	7/12				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 1-087-002, 072511-200

Other Comments: _____

PC Secondary Review: KB 10/4/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

October 14, 2011

Service Request No: R1105400

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 ESTCP PED TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on September 29, 2011. For your reference, these analyses have been assigned our service request number **R1105400**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 9/28/11
Sample Matrix: Water

Service Request No.: R1105400
Date Received: 9/29/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples and one (1) Trip Blank were collected by the client on 9/28/11 and were received for analysis at Columbia Analytical Services on 9/29/11 via a national courier. The samples were received at a cooler temperature of 2.7°C within the guidelines of 0-6°C. Sample vials received from CAS were preserved with HCL. The client triple rinsed the vials prior to sampling.

Organic Compounds

Two (2) water samples and one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD), (RSK & Organic Acids) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for Acetone on the 10/4/11 analytical run. No data was affected. The Trip Blank also had low level contamination for Acetone.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All LCS and LCSD (Sulfide) recoveries were within QC limits.

Approved by Jason Bunker Date 10/14/11

All samples were analyzed within holding times for these analyses except for Nitrite analysis which were repeated outside of the 48 hour holding time by less than 2 hours due to an interfering Chloride peak on the initial analysis. Only the reanalysis date has been reported. The data has been flagged as "*" for the holding time exceedence.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by

Karen Berber

Date

10/14/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1105400

<u>Lab ID</u>	<u>Client ID</u>
R1105400-001	LC34-RW0007-038.5-20110928
R1105400-002	LC34-RW0007-038.5-20110928 Dissolved
R1105400-003	LC34-RW0008-052.0-20110928
R1105400-004	LC34-RW0008-052.0-20110928 Dissolved
R1105400-005	LC34-TB-20110928

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
 1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110928
Lab Code: R1105400-001

Service Request: R1105400
Date Collected: 9/28/11 1047
Date Received: 9/29/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	440		mg/L	2.0	1	NA	10/4/11 09:00	
Bromide	300.0	16.0		mg/L	1.0	10	NA	9/29/11 17:48	
Carbon, Total Organic (TOC), Average	9060A	242		mg/L	10	10	NA	9/30/11 14:14	
Chloride	300.0	509		mg/L	20	100	NA	9/30/11 12:23	
Iodide	300.0	11.5		mg/L	2.0	10	NA	10/10/11 13:33	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	9/29/11 17:48	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	9/30/11 12:23	*
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	9/29/11 17:48	
Sulfide, Total	SM 4500-S2- F	19.9		mg/L	1.0	1	NA	9/30/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110928 Dissolved
Lab Code: R1105400-002

Service Request: R1105400
Date Collected: 9/28/11 1047
Date Received: 9/29/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/ 3/11	10/5/11 21:32	
Iron, Dissolved	6010C	140	µg/L	100	1	10/ 3/11	10/5/11 21:32	
Manganese, Dissolved	6010C	21	µg/L	10	1	10/ 3/11	10/5/11 21:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 ESTCP PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20110928
 Lab Code: R1105400-001

Service Request: R1105400
 Date Collected: 9/28/11 1047
 Date Received: 9/29/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	10/3/11 19:22		263769	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,1,2-Trichloroethane	500	U	500	23	100	NA	10/3/11 19:22		263769	
1,1,2-Trichloro-1,2,2-trifluoroethane	12000		500	31	100	NA	10/3/11 19:22		263769	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,1-Dichloroethene (1,1-DCE)	41	I	500	29	100	NA	10/3/11 19:22		263769	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	10/3/11 19:22		263769	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	10/3/11 19:22		263769	
1,2-Dibromoethane	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,2-Dichlorobenzene	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,2-Dichloroethane	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,2-Dichloropropane	500	U	500	29	100	NA	10/3/11 19:22		263769	
1,3-Dichlorobenzene	500	U	500	20	100	NA	10/3/11 19:22		263769	
1,4-Dichlorobenzene	500	U	500	20	100	NA	10/3/11 19:22		263769	
n-Butanol	2700	I	25000	1100	100	NA	10/3/11 19:22		263769	
2-Butanone (MEK)	1000	U	1000	51	100	NA	10/3/11 19:22		263769	
2-Hexanone	1000	U	1000	35	100	NA	10/3/11 19:22		263769	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	10/3/11 19:22		263769	
Acetone	2000	U	2000	98	100	NA	10/3/11 19:22		263769	
Benzene	500	U	500	21	100	NA	10/3/11 19:22		263769	
Bromodichloromethane	500	U	500	20	100	NA	10/3/11 19:22		263769	
Bromoform	500	U	500	27	100	NA	10/3/11 19:22		263769	
Bromomethane	500	U	500	31	100	NA	10/3/11 19:22		263769	
Carbon Disulfide	1000	U	1000	20	100	NA	10/3/11 19:22		263769	
Carbon Tetrachloride	500	U	500	27	100	NA	10/3/11 19:22		263769	
Chlorobenzene	500	U	500	20	100	NA	10/3/11 19:22		263769	
Chloroethane	500	U	500	31	100	NA	10/3/11 19:22		263769	
Chloroform	500	U	500	22	100	NA	10/3/11 19:22		263769	
Chloromethane	500	U	500	24	100	NA	10/3/11 19:22		263769	
Cyclohexane	1000	U	1000	24	100	NA	10/3/11 19:22		263769	
Dibromochloromethane	500	U	500	20	100	NA	10/3/11 19:22		263769	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	10/3/11 19:22		263769	
Dichloromethane	500	U	500	22	100	NA	10/3/11 19:22		263769	
Ethylbenzene	500	U	500	20	100	NA	10/3/11 19:22		263769	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	10/3/11 19:22		263769	
Methyl Acetate	1000	U	1000	23	100	NA	10/3/11 19:22		263769	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110928
Lab Code: R1105400-001

Service Request: R1105400
Date Collected: 9/28/11 1047
Date Received: 9/29/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	500	U	500	20	100	NA	10/3/11 19:22		263769	
Methylcyclohexane	1000	U	1000	25	100	NA	10/3/11 19:22		263769	
Styrene	500	U	500	20	100	NA	10/3/11 19:22		263769	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	10/3/11 19:22		263769	
Toluene	500	U	500	20	100	NA	10/3/11 19:22		263769	
Trichloroethene (TCE)	5700		500	23	100	NA	10/3/11 19:22		263769	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	10/3/11 19:22		263769	
Vinyl Chloride	3700		500	23	100	NA	10/3/11 19:22		263769	
cis-1,2-Dichloroethene	15000		500	20	100	NA	10/3/11 19:22		263769	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	10/3/11 19:22		263769	
m,p-Xylenes	500	U	500	20	100	NA	10/3/11 19:22		263769	
n-Butyl Acetate	500	U	500	21	100	NA	10/3/11 19:22		263769	
o-Xylene	500	U	500	20	100	NA	10/3/11 19:22		263769	
trans-1,2-Dichloroethene	140	I	500	20	100	NA	10/3/11 19:22		263769	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	10/3/11 19:22		263769	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	10/3/11 19:22	
Dibromofluoromethane	102	89-119	10/3/11 19:22	
Toluene-d8	104	87-121	10/3/11 19:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20110928
Lab Code: R1105400-001

Service Request: R1105400
Date Collected: 9/28/11 1047
Date Received: 9/29/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	46		1.0	1	NA	9/29/11 15:27		263291	
Ethene	53		1.0	1	NA	9/29/11 15:27		263291	
Methane	380		10	5	NA	9/29/11 15:37		263291	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Collected: 9/28/11 1047
Date Received: 9/29/11
Date Analyzed: 9/30/11 01:37

Sample Name: LC34-RW0007-038.5-20110928
Lab Code: R1105400-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\092911\X0006485.D\

Analysis Lot: 263305
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	260	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	250	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	18	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110928
Lab Code: R1105400-003

Service Request: R1105400
Date Collected: 9/28/11 1130
Date Received: 9/29/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	271	mg/L	2.0	1	NA	10/4/11 09:00	
Bromide	300.0	2.8	mg/L	1.0	10	NA	9/29/11 18:53	
Carbon, Total Organic (TOC), Average	9060A	64	mg/L	10	10	NA	9/30/11 14:54	
Chloride	300.0	633	mg/L	20	100	NA	9/30/11 12:35	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/10/11 13:58	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	9/29/11 18:53	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	9/30/11 12:35	*
Sulfate	300.0	13.4	mg/L	2.0	10	NA	9/29/11 18:53	
Sulfide, Total	SM 4500-S2- F	14.0	mg/L	1.0	1	NA	9/30/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110928 Dissolved
Lab Code: R1105400-004

Service Request: R1105400
Date Collected: 9/28/11 1130
Date Received: 9/29/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/ 3/11	10/5/11 21:38	
Iron, Dissolved	6010C	140		µg/L	100	1	10/ 3/11	10/5/11 21:38	
Manganese, Dissolved	6010C	16		µg/L	10	1	10/ 3/11	10/5/11 21:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 ESTCP PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20110928
 Lab Code: R1105400-003

Service Request: R1105400
 Date Collected: 9/28/11 1130
 Date Received: 9/29/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25 U	25	1.2	5	NA	10/3/11 19:52		263769	
1,1,2,2-Tetrachloroethane	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,1,2-Trichloroethane	25 U	25	1.2	5	NA	10/3/11 19:52		263769	
1,1,2-Trichloro-1,2,2-trifluoroethane	590	25	1.6	5	NA	10/3/11 19:52		263769	
1,1-Dichloroethane (1,1-DCA)	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,1-Dichloroethene (1,1-DCE)	3.1 I	25	1.5	5	NA	10/3/11 19:52		263769	
1,2,4-Trichlorobenzene	25 U	25	1.3	5	NA	10/3/11 19:52		263769	
1,2-Dibromo-3-chloropropane (DBCP)	25 U	25	1.9	5	NA	10/3/11 19:52		263769	
1,2-Dibromoethane	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,2-Dichlorobenzene	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,2-Dichloroethane	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,2-Dichloropropane	25 U	25	1.5	5	NA	10/3/11 19:52		263769	
1,3-Dichlorobenzene	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
1,4-Dichlorobenzene	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
n-Butanol	1300 U	1300	53	5	NA	10/3/11 19:52		263769	
2-Butanone (MEK)	50 U	50	2.6	5	NA	10/3/11 19:52		263769	
2-Hexanone	50 U	50	1.8	5	NA	10/3/11 19:52		263769	
4-Methyl-2-pentanone	50 U	50	1.4	5	NA	10/3/11 19:52		263769	
Acetone	100 U	100	4.9	5	NA	10/3/11 19:52		263769	
Benzene	25 U	25	1.1	5	NA	10/3/11 19:52		263769	
Bromodichloromethane	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
Bromoform	25 U	25	1.4	5	NA	10/3/11 19:52		263769	
Bromomethane	25 U	25	1.6	5	NA	10/3/11 19:52		263769	
Carbon Disulfide	1.1 I	50	1.0	5	NA	10/3/11 19:52		263769	
Carbon Tetrachloride	25 U	25	1.4	5	NA	10/3/11 19:52		263769	
Chlorobenzene	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
Chloroethane	25 U	25	1.6	5	NA	10/3/11 19:52		263769	
Chloroform	25 U	25	1.1	5	NA	10/3/11 19:52		263769	
Chloromethane	25 U	25	1.2	5	NA	10/3/11 19:52		263769	
Cyclohexane	50 U	50	1.2	5	NA	10/3/11 19:52		263769	
Dibromochloromethane	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
Dichlorodifluoromethane (CFC 12)	25 U	25	2.9	5	NA	10/3/11 19:52		263769	
Dichloromethane	25 U	25	1.1	5	NA	10/3/11 19:52		263769	
Ethylbenzene	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
Isopropylbenzene (Cumene)	25 U	25	1.0	5	NA	10/3/11 19:52		263769	
Methyl Acetate	50 U	50	1.2	5	NA	10/3/11 19:52		263769	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110928
Lab Code: R1105400-003

Service Request: R1105400
Date Collected: 9/28/11 1130
Date Received: 9/29/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
Methylcyclohexane	50	U	50	1.3	5	NA	10/3/11 19:52		263769	
Styrene	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
Toluene	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
Trichloroethene (TCE)	1100		50	2.4	10	NA	10/4/11 15:31		263945	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
Vinyl Chloride	410		25	1.2	5	NA	10/3/11 19:52		263769	
cis-1,2-Dichloroethene	1100		50	2.0	10	NA	10/4/11 15:31		263945	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
m,p-Xylenes	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
n-Butyl Acetate	25	U	25	1.1	5	NA	10/3/11 19:52		263769	
o-Xylene	25	U	25	1.0	5	NA	10/3/11 19:52		263769	
trans-1,2-Dichloroethene	7.6	I	25	1.0	5	NA	10/3/11 19:52		263769	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	10/3/11 19:52		263769	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	10/3/11 19:52	
Dibromofluoromethane	103	89-119	10/3/11 19:52	
Toluene-d8	104	87-121	10/3/11 19:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20110928
Lab Code: R1105400-003

Service Request: R1105400
Date Collected: 9/28/11 1130
Date Received: 9/29/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	5.6		5.0	5	NA	9/29/11 16:06		263291	
Ethene	28		5.0	5	NA	9/29/11 16:06		263291	
Methane	410		10	5	NA	9/29/11 16:06		263291	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Collected: 9/28/11 1130
Date Received: 9/29/11
Date Analyzed: 9/30/11 03:40

Sample Name: LC34-RW0008-052.0-20110928
Lab Code: R1105400-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUADATA\HPLC05\DATA\092911\X0006487.D\

Analysis Lot: 263305
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	140	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	12	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	2.2	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 ESTCP PED TR0272
 Sample Matrix: Water
 Sample Name: LC34-TB-20110928
 Lab Code: R1105400-005

Service Request: R1105400
 Date Collected: 9/28/11
 Date Received: 9/29/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	1	NA	10/3/11 20:22		263769	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,1,2-Trichloroethane	5.0 U	5.0	0.23	1	NA	10/3/11 20:22		263769	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	1	NA	10/3/11 20:22		263769	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	1	NA	10/3/11 20:22		263769	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	1	NA	10/3/11 20:22		263769	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	1	NA	10/3/11 20:22		263769	
1,2-Dibromoethane	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,2-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,2-Dichloroethane	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,2-Dichloropropane	5.0 U	5.0	0.28	1	NA	10/3/11 20:22		263769	
1,3-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
1,4-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
n-Butanol	250 U	250	11	1	NA	10/3/11 20:22		263769	
2-Butanone (MEK)	10 U	10	0.51	1	NA	10/3/11 20:22		263769	
2-Hexanone	10 U	10	0.35	1	NA	10/3/11 20:22		263769	
4-Methyl-2-pentanone	10 U	10	0.27	1	NA	10/3/11 20:22		263769	
Acetone	1.3 I	20	0.98	1	NA	10/3/11 20:22		263769	
Benzene	5.0 U	5.0	0.21	1	NA	10/3/11 20:22		263769	
Bromodichloromethane	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Bromoform	5.0 U	5.0	0.27	1	NA	10/3/11 20:22		263769	
Bromomethane	5.0 U	5.0	0.31	1	NA	10/3/11 20:22		263769	
Carbon Disulfide	10 U	10	0.20	1	NA	10/3/11 20:22		263769	
Carbon Tetrachloride	5.0 U	5.0	0.27	1	NA	10/3/11 20:22		263769	
Chlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Chloroethane	5.0 U	5.0	0.31	1	NA	10/3/11 20:22		263769	
Chloroform	5.0 U	5.0	0.22	1	NA	10/3/11 20:22		263769	
Chloromethane	5.0 U	5.0	0.24	1	NA	10/3/11 20:22		263769	
Cyclohexane	10 U	10	0.24	1	NA	10/3/11 20:22		263769	
Dibromochloromethane	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	1	NA	10/3/11 20:22		263769	
Dichloromethane	5.0 U	5.0	0.22	1	NA	10/3/11 20:22		263769	
Ethylbenzene	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Methyl Acetate	10 U	10	0.23	1	NA	10/3/11 20:22		263769	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: LC34-TB-20110928
Lab Code: R1105400-005

Service Request: R1105400
Date Collected: 9/28/11
Date Received: 9/29/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Methylcyclohexane	10	U	10	0.25	1	NA	10/3/11 20:22		263769	
Styrene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Toluene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/3/11 20:22		263769	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/3/11 20:22		263769	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/3/11 20:22		263769	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/3/11 20:22		263769	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	10/3/11 20:22	
Dibromofluoromethane	100	89-119	10/3/11 20:22	
Toluene-d8	104	87-121	10/3/11 20:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105400-MB

Service Request: R1105400
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	10/4/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	9/29/11 15:58	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/30/11 12:54	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	9/30/11 09:23	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	10/10/11 12:50	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/29/11 15:58	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	9/30/11 09:23	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	9/29/11 15:58	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	9/30/11 12:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105400-MB1

Service Request: R1105400
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/ 3/11	10/5/11 18:31	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/ 3/11	10/5/11 18:31	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	10/ 3/11	10/5/11 18:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105400-MB2

Service Request: R1105400
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/ 3/11	10/5/11 18:36	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/ 3/11	10/5/11 18:36	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	10/ 3/11	10/5/11 18:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 ESTCP PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1109870-01

Service Request: R1105400
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	1	NA	10/3/11 13:20		263769	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,1,2-Trichloroethane	5.0 U	5.0	0.23	1	NA	10/3/11 13:20		263769	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	1	NA	10/3/11 13:20		263769	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	1	NA	10/3/11 13:20		263769	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	1	NA	10/3/11 13:20		263769	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	1	NA	10/3/11 13:20		263769	
1,2-Dibromoethane	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,2-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,2-Dichloroethane	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,2-Dichloropropane	5.0 U	5.0	0.28	1	NA	10/3/11 13:20		263769	
1,3-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
1,4-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
n-Butanol	250 U	250	11	1	NA	10/3/11 13:20		263769	
2-Butanone (MEK)	10 U	10	0.51	1	NA	10/3/11 13:20		263769	
2-Hexanone	10 U	10	0.35	1	NA	10/3/11 13:20		263769	
4-Methyl-2-pentanone	10 U	10	0.27	1	NA	10/3/11 13:20		263769	
Acetone	20 U	20	0.98	1	NA	10/3/11 13:20		263769	
Benzene	5.0 U	5.0	0.21	1	NA	10/3/11 13:20		263769	
Bromodichloromethane	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Bromoform	5.0 U	5.0	0.27	1	NA	10/3/11 13:20		263769	
Bromomethane	5.0 U	5.0	0.31	1	NA	10/3/11 13:20		263769	
Carbon Disulfide	10 U	10	0.20	1	NA	10/3/11 13:20		263769	
Carbon Tetrachloride	5.0 U	5.0	0.27	1	NA	10/3/11 13:20		263769	
Chlorobenzene	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Chloroethane	5.0 U	5.0	0.31	1	NA	10/3/11 13:20		263769	
Chloroform	5.0 U	5.0	0.22	1	NA	10/3/11 13:20		263769	
Chloromethane	5.0 U	5.0	0.24	1	NA	10/3/11 13:20		263769	
Cyclohexane	10 U	10	0.24	1	NA	10/3/11 13:20		263769	
Dibromochloromethane	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	1	NA	10/3/11 13:20		263769	
Dichloromethane	5.0 U	5.0	0.22	1	NA	10/3/11 13:20		263769	
Ethylbenzene	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Methyl Acetate	10 U	10	0.23	1	NA	10/3/11 13:20		263769	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1109870-01

Service Request: R1105400
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Methylcyclohexane	10	U	10	0.25	1	NA	10/3/11 13:20		263769	
Styrene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Toluene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/3/11 13:20		263769	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/3/11 13:20		263769	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/3/11 13:20		263769	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/3/11 13:20		263769	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	10/3/11 13:20	
Dibromofluoromethane	100	89-119	10/3/11 13:20	
Toluene-d8	104	87-121	10/3/11 13:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: LC34 ESTCP PED TR0272
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1109920-01

Service Request: R1105400
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/4/11 13:31		263945	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/4/11 13:31		263945	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/4/11 13:31		263945	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/4/11 13:31		263945	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/4/11 13:31		263945	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/4/11 13:31		263945	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/4/11 13:31		263945	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
n-Butanol	250	U	250	11	1	NA	10/4/11 13:31		263945	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/4/11 13:31		263945	
2-Hexanone	10	U	10	0.35	1	NA	10/4/11 13:31		263945	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/4/11 13:31		263945	
Acetone	20	U	20	0.98	1	NA	10/4/11 13:31		263945	
Benzene	5.0	U	5.0	0.21	1	NA	10/4/11 13:31		263945	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Bromoform	5.0	U	5.0	0.27	1	NA	10/4/11 13:31		263945	
Bromomethane	0.32	I	5.0	0.31	1	NA	10/4/11 13:31		263945	
Carbon Disulfide	10	U	10	0.20	1	NA	10/4/11 13:31		263945	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/4/11 13:31		263945	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/4/11 13:31		263945	
Chloroform	5.0	U	5.0	0.22	1	NA	10/4/11 13:31		263945	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/4/11 13:31		263945	
Cyclohexane	10	U	10	0.24	1	NA	10/4/11 13:31		263945	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/4/11 13:31		263945	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/4/11 13:31		263945	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Methyl Acetate	10	U	10	0.23	1	NA	10/4/11 13:31		263945	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1109920-01

Service Request: R1105400
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Methylcyclohexane	10	U	10	0.25	1	NA	10/4/11 13:31		263945	
Styrene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Toluene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/4/11 13:31		263945	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/4/11 13:31		263945	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/4/11 13:31		263945	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/4/11 13:31		263945	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/4/11 13:31	
Dibromofluoromethane	103	89-119	10/4/11 13:31	
Toluene-d8	107	87-121	10/4/11 13:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1109782-01

Service Request: R1105400
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	9/29/11 11:26		263291	
Ethene	1.0	U	1.0	1	NA	9/29/11 11:26		263291	
Methane	2.0	U	2.0	1	NA	9/29/11 11:26		263291	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Collected: NA
Date Received: NA
Date Analyzed: 9/29/11 12:15

Sample Name: Method Blank
Lab Code: RQ1109692-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC05\DATA\092911\X0006472.D\

Analysis Lot: 263305
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 9/30/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105400-LCS1			Duplicate Lab Control Sample R1105400-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.50	6.4	102	6.54	6.4	103	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 9/29/11 -
 10/10/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105400-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.00	1.00	100	90 - 110
Chloride	300.0	2.03	2.00	102	90 - 110
Iodide	300.0	0.958	1.00	96	90 - 110
Nitrate as Nitrogen	300.0	1.06	1.00	106	90 - 110
Sulfate	300.0	2.02	2.00	101	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.5	20.0	98	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.0	10.0	100	86 - 117
Nitrite as Nitrogen	300.0	1.04	1.0	104	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 10/ 5/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105400-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Arsenic, Dissolved	6010C	38.4	40	96	80 - 120
Iron, Dissolved	6010C	1030	1000	103	80 - 120
Manganese, Dissolved	6010C	499	500	100	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 10/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 263769

**Lab Control Sample
 RQ1109870-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.9	20.0	95	72 - 128
1,1,2,2-Tetrachloroethane	19.4	20.0	97	72 - 131
1,1,2-Trichloroethane	19.2	20.0	96	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.7	20.0	89	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.8	20.0	99	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.0	20.0	90	72 - 129
1,2,4-Trichlorobenzene	19.2	20.0	96	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.0	20.0	95	62 - 131
1,2-Dibromoethane	19.5	20.0	97	78 - 125
1,2-Dichlorobenzene	20.4	20.0	102	79 - 124
1,2-Dichloroethane	19.5	20.0	98	73 - 127
1,2-Dichloropropane	19.6	20.0	98	80 - 123
1,3-Dichlorobenzene	20.1	20.0	101	78 - 124
1,4-Dichlorobenzene	20.1	20.0	100	78 - 123
n-Butanol	831	1000	83	70 - 130
2-Butanone (MEK)	18.2	20.0	91	60 - 133
2-Hexanone	19.8	20.0	99	61 - 131
4-Methyl-2-pentanone	19.9	20.0	99	61 - 132
Acetone	19.1	20.0	95	54 - 139
Benzene	19.3	20.0	96	78 - 121
Bromodichloromethane	20.2	20.0	101	80 - 125
Bromoform	20.6	20.0	103	68 - 130
Bromomethane	22.1	20.0	110	57 - 144
Carbon Disulfide	19.8	20.0	99	52 - 140
Carbon Tetrachloride	19.1	20.0	96	68 - 133
Chlorobenzene	19.9	20.0	100	80 - 121
Chloroethane	21.5	20.0	107	71 - 130
Chloroform	19.6	20.0	98	78 - 125
Chloromethane	19.7	20.0	99	61 - 138
Cyclohexane	17.9	20.0	89	57 - 126
Dibromochloromethane	20.4	20.0	102	78 - 133
Dichlorodifluoromethane (CFC 12)	19.5	20.0	97	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 10/ 3/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 263769

**Lab Control Sample
 RQ1109870-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.1	20.0	96	75 - 125
Ethylbenzene	19.9	20.0	100	78 - 123
Isopropylbenzene (Cumene)	21.7	20.0	109	73 - 133
Methyl Acetate	18.9	20.0	94	57 - 157
Methyl tert-Butyl Ether	18.5	20.0	92	75 - 126
Methylcyclohexane	18.1	20.0	90	61 - 125
Styrene	20.6	20.0	103	80 - 132
Tetrachloroethene (PCE)	19.8	20.0	99	72 - 131
Toluene	19.7	20.0	98	78 - 122
Trichloroethene (TCE)	20.4	20.0	102	74 - 127
Trichlorofluoromethane (CFC 11)	20.5	20.0	102	69 - 141
Vinyl Chloride	21.3	20.0	107	72 - 138
cis-1,2-Dichloroethene	19.7	20.0	98	78 - 122
cis-1,3-Dichloropropene	19.3	20.0	96	77 - 125
m,p-Xylenes	40.6	40.0	101	79 - 126
n-Butyl Acetate	18.1	20.0	90	31 - 144
o-Xylene	20.2	20.0	101	77 - 118
trans-1,2-Dichloroethene	18.9	20.0	94	75 - 121
trans-1,3-Dichloropropene	19.2	20.0	96	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 10/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 263945

**Lab Control Sample
 RQ1109920-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.8	20.0	84	72 - 128
1,1,2,2-Tetrachloroethane	19.3	20.0	97	72 - 131
1,1,2-Trichloroethane	18.5	20.0	92	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.7	20.0	79	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.4	20.0	97	76 - 124
1,1-Dichloroethene (1,1-DCE)	15.9	20.0	79	72 - 129
1,2,4-Trichlorobenzene	18.5	20.0	92	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.6	20.0	83	62 - 131
1,2-Dibromoethane	18.2	20.0	91	78 - 125
1,2-Dichlorobenzene	17.9	20.0	89	79 - 124
1,2-Dichloroethane	19.7	20.0	99	73 - 127
1,2-Dichloropropane	19.0	20.0	95	80 - 123
1,3-Dichlorobenzene	17.4	20.0	87	78 - 124
1,4-Dichlorobenzene	17.7	20.0	88	78 - 123
n-Butanol	1050	1000	104	70 - 130
2-Butanone (MEK)	19.5	20.0	98	60 - 133
2-Hexanone	19.0	20.0	95	61 - 131
4-Methyl-2-pentanone	19.7	20.0	98	61 - 132
Acetone	20.8	20.0	104	54 - 139
Benzene	17.4	20.0	87	78 - 121
Bromodichloromethane	19.2	20.0	96	80 - 125
Bromoform	17.8	20.0	89	68 - 130
Bromomethane	21.0	20.0	105	57 - 144
Carbon Disulfide	19.9	20.0	99	52 - 140
Carbon Tetrachloride	16.4	20.0	82	68 - 133
Chlorobenzene	17.4	20.0	87	80 - 121
Chloroethane	20.2	20.0	101	71 - 130
Chloroform	18.6	20.0	93	78 - 125
Chloromethane	18.9	20.0	94	61 - 138
Cyclohexane	21.7	20.0	109	57 - 126
Dibromochloromethane	18.7	20.0	93	78 - 133
Dichlorodifluoromethane (CFC 12)	17.2	20.0	86	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 10/ 4/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 263945

**Lab Control Sample
 RQ1109920-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.1	20.0	91	75 - 125
Ethylbenzene	17.0	20.0	85	78 - 123
Isopropylbenzene (Cumene)	18.6	20.0	93	73 - 133
Methyl Acetate	21.7	20.0	108	57 - 157
Methyl tert-Butyl Ether	18.7	20.0	94	75 - 126
Methylcyclohexane	22.3	20.0	111	61 - 125
Styrene	18.1	20.0	91	80 - 132
Tetrachloroethene (PCE)	15.8	20.0	79	72 - 131
Toluene	17.4	20.0	87	78 - 122
Trichloroethene (TCE)	16.5	20.0	83	74 - 127
Trichlorofluoromethane (CFC 11)	18.7	20.0	93	69 - 141
Vinyl Chloride	19.8	20.0	99	72 - 138
cis-1,2-Dichloroethene	18.1	20.0	90	78 - 122
cis-1,3-Dichloropropene	18.1	20.0	91	77 - 125
m,p-Xylenes	34.5	40.0	86	79 - 126
n-Butyl Acetate	20.5	20.0	103	31 - 144
o-Xylene	17.5	20.0	87	77 - 118
trans-1,2-Dichloroethene	17.1	20.0	85	75 - 121
trans-1,3-Dichloropropene	18.0	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 9/29/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 263291

Analyte Name	Lab Control Sample RQ1109782-02			Duplicate Lab Control Sample RQ1109782-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	29.4	26.0	113	27.7	26.0	106	56 - 148	6	30
Ethene	24.5	24.3	101	23.4	24.3	96	58 - 155	5	30
Methane	29.8	26.2	114	28.1	26.2	107	55 - 150	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 ESTCP PED TR0272
Sample Matrix: Water

Service Request: R1105400
Date Analyzed: 9/29/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 263305

Analyte Name	Lab Control Sample RQ1109692-02			Duplicate Lab Control Sample RQ1109692-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.960	1.00	96	0.980	1.00	98	70 - 130	2	30
Acetic Acid	9.75	10.0	98	9.77	10.0	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.80	10.0	98	10.1	10.0	101	78 - 113	3	30
Lactic Acid	8.65	9.97	87	8.74	9.97	88	61 - 109	1	30
Propionic Acid	10.1	9.97	102	9.58	9.97	96	80 - 125	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCPC PED LC34 Project Number: TR0272
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:

Sampler's Signature: *Cory Repta*

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20110928	09/28/11	1047	001.002	W
LC34-RW0008-052.0-20110928	09/28/11	1130	003.004	W
LC34-TB-20110928	NA	NA	-005	W

Number of Containers	Analysis Requested									REMARKS
	VOCs (826C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Antions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)		
15	3	2	1	3	1	3	1	1	1	
15	3	2	1	3	1	3	1	1	1	
3	3									


TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 Please filter dissolved metals in lab.
Containers for VOCs (8260C) were triple rinsed in field with DI Water to remove HCl preservatives.

R1105400
 Geosyntec Consultants
 LC34 ESTCPC PED TR0272



RECEIVED BY:
 Signature: *Joseph Carjett*
 Printed Name: JOSEPH CARJETT
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 09/28/11 - 1630

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: *Daniel White*
 Printed Name: Daniel White
 Firm: CAS
 Date/Time: 9/29/11 / 0950

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec

Folder Number R1105400

Cooler received on 9/29/11 by: DPW COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did ~~VOA~~ vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A ✓
5. Were ~~ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 2.7

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 9/29/11/1015

Thermometer ID: IR GUN#3 / ~~IR GUN#4~~ Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: UB 9/29/11

Cooler Breakdown: Date: 9/29/11 Time: 1201 by: DPW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-	<u>WC103098C</u>	<u>5/12</u>	*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
HCl	*	*	<u>4110060</u>	<u>8/12</u>					

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 1-132-001, 1-087-002, 082911-2H, 072511-2DD

Other Comments: * 2 vials for the Trip Blank

PC Secondary Review: KB 10/14/11

*significant air bubbles: VOA > 5-6 mm ; WC > 1 in. diameter

October 31, 2011

Service Request No: R1105742

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 10/13/11/ TR0272A

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on October 14, 2011. For your reference, these analyses have been assigned our service request number **R1105742**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 33

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 10/13/11
Sample Matrix: Water

Service Request No.: R1105742
Date Received: 10/14/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 10/13/11 and were received for analysis at Columbia Analytical Services on 10/14/11 via a national courier. The samples were received at a cooler temperature of 2.4°C within the guidelines of 0-6°C.

Organic Compounds

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C, Organic Acids by HPLC, and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples for 8260C except for the %D for Bromomethane which was outside the $\pm 20\%$ D limits at -27.7% on the 10/17/11 analytical run. Any hits for this compound associated with the samples should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD), (RSK & Organic Acids) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

The Retention Time (RT) for ethane is within the proper window for this compound however, the peak is off in time relative to methane and ethylene. As a result, ethane results may be slightly biased.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Batch QC is included in the report. All LCS and LCSD (Sulfide) recoveries were within QC limits.

Approved by Kevin Bernhe Date 10/31/11

000002

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0 The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by



Date

10/31/11

CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1105742

<u>Lab ID</u>	<u>Client ID</u>
R1105742-001	LC34-RW0007-038.5-20111013
R1105742-002	LC34-RW0007-038.5-20111013 Dissolved
R1105742-003	LC34-RW0008-052.0-20111013
R1105742-004	LC34-RW0008-052.0-20111013 Dissolved

REPORT QUALIFIERS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Aroclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- * Indicates that a quality control parameter has exceeded laboratory limits. Under the “Notes” column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an “immediate” hold time criteria.
- # Spike was diluted out.
- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% (25% for CLP) difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed ($\geq 100\%$ Difference between two GC columns).
- X See Case Narrative for discussion.



CAS/Rochester Lab ID # for State Certifications¹

NELAP Accredited
 Connecticut ID # PH0556
 Delaware Accredited
 DoD ELAP #65817
 Florida ID # E87674
 Illinois ID #200047
 Maine ID #NY0032

Nebraska Accredited
 Nevada ID # NY-00032
 New Jersey ID # NY004
 New York ID # 10145
 New Hampshire ID # 294100 A/B
 Pennsylvania ID# 68-786
 Rhode Island ID # 158

¹ Analyses were performed according to our laboratory’s NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to the certifications section at www.caslab.com.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111013
Lab Code: R1105742-001

Service Request: R1105742
Date Collected: 10/13/11 0944
Date Received: 10/14/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	468	mg/L	2.0	1	NA	10/21/11 09:00	
Bromide	300.0	17.8	mg/L	1.0	10	NA	10/14/11 17:47	
Carbon, Total Organic (TOC), Average	9060A	262	mg/L	10	10	NA	10/15/11 14:56	
Chloride	300.0	433	mg/L	20	100	NA	10/14/11 18:00	
Iodide	300.0	14.5	mg/L	2.0	10	NA	10/27/11 11:08	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	10/14/11 17:47	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	10/14/11 18:00	
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	10/14/11 17:47	
Sulfide, Total	SM 4500-S2- F	16.9	mg/L	0.93	1	NA	10/14/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 10/13/11/ TR0272A
 Sample Matrix: Water

Service Request: R1105742
 Date Collected: 10/13/11 0944
 Date Received: 10/14/11
 Date Analyzed: 10/17/11 14:21

Sample Name: LC34-RW0007-038.5-20111013
 Lab Code: R1105742-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\101711\D5282.D\

Analysis Lot: 265559
 Instrument Name: R-MS-10
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	11000	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	39 I	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	2900 I	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	2000 U	2000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	500 U	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 0944
Date Received: 10/14/11
Date Analyzed: 10/17/11 14:21

Sample Name: LC34-RW0007-038.5-20111013
Lab Code: R1105742-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\101711\D5282.D\

Analysis Lot: 265559
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500 U	500	20	
79-20-9	Methyl Acetate	1000 U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500 U	500	20	
108-87-2	Methylcyclohexane	1000 U	1000	25	
100-42-5	Styrene	500 U	500	20	
127-18-4	Tetrachloroethene (PCE)	500 U	500	20	
108-88-3	Toluene	500 U	500	20	
79-01-6	Trichloroethene (TCE)	4300	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500 U	500	20	
75-01-4	Vinyl Chloride	4300	500	23	
156-59-2	cis-1,2-Dichloroethene	15000	500	20	
10061-01-5	cis-1,3-Dichloropropene	500 U	500	20	
179601-23-1	m,p-Xylenes	500 U	500	20	
123-86-4	n-Butyl Acetate	500 U	500	21	
95-47-6	o-Xylene	500 U	500	20	
156-60-5	trans-1,2-Dichloroethene	190 I	500	20	
10061-02-6	trans-1,3-Dichloropropene	500 U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	10/17/11 14:21	
Dibromofluoromethane	102	89-119	10/17/11 14:21	
Toluene-d8	104	87-121	10/17/11 14:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 0944
Date Received: 10/14/11
Date Analyzed: 10/18/11 09:50

Sample Name: LC34-RW0007-038.5-20111013
Lab Code: R1105742-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star277.run

Analysis Lot: 265794
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	48		5.0	
74-85-1	Ethene	86		5.0	
74-82-8	Methane	420		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 0944
Date Received: 10/14/11
Date Analyzed: 10/17/11 18:59

Sample Name: LC34-RW0007-038.5-20111013
Lab Code: R1105742-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\101711\X0006510.D\

Analysis Lot: 265510
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	2.5	U	2.5	
64-19-7	Acetic Acid	280		5.0	
107-92-6	Butanoic Acid (Butyric Acid)	300		10	
50-21-5	Lactic Acid	5.0	U	5.0	
79-09-4	Propionic Acid	22		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111013 Dissolved
Lab Code: R1105742-002

Service Request: R1105742
Date Collected: 10/13/11 0944
Date Received: 10/14/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/17/11	10/22/11 00:31	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/17/11	10/22/11 00:31	
Manganese, Dissolved	6010C	23	µg/L	10	1	10/17/11	10/22/11 00:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111013
Lab Code: R1105742-003

Service Request: R1105742
Date Collected: 10/13/11 1022
Date Received: 10/14/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	287	mg/L	2.0	1	NA	10/21/11 09:00	
Bromide	300.0	4.2	mg/L	1.0	10	NA	10/14/11 18:12	
Carbon, Total Organic (TOC), Average	9060A	61	mg/L	10	10	NA	10/15/11 15:35	
Chloride	300.0	624	mg/L	20	100	NA	10/14/11 18:25	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 11:34	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	10/14/11 18:12	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	10/14/11 18:25	
Sulfate	300.0	15.9	mg/L	2.0	10	NA	10/14/11 18:12	
Sulfide, Total	SM 4500-S2- F	14.5	mg/L	0.94	1	NA	10/14/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 10/13/11/ TR0272A
 Sample Matrix: Water

Service Request: R1105742
 Date Collected: 10/13/11 1022
 Date Received: 10/14/11
 Date Analyzed: 10/17/11 14:51

Sample Name: LC34-RW0008-052.0-20111013
 Lab Code: R1105742-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\101711\101711.D

Analysis Lot: 265559
 Instrument Name: R-MS-10
 Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	760		50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	
106-93-4	1,2-Dibromoethane	50	U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.0	
107-06-2	1,2-Dichloroethane	50	U	50	2.0	
78-87-5	1,2-Dichloropropane	50	U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	2500	U	2500	110	
78-93-3	2-Butanone (MEK)	100	U	100	5.1	
591-78-6	2-Hexanone	100	U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100	U	100	2.7	
67-64-1	Acetone	200	U	200	9.8	
71-43-2	Benzene	50	U	50	2.1	
75-27-4	Bromodichloromethane	50	U	50	2.0	
75-25-2	Bromoform	50	U	50	2.7	
74-83-9	Bromomethane	50	U	50	3.1	
75-15-0	Carbon Disulfide	100	U	100	2.0	
56-23-5	Carbon Tetrachloride	50	U	50	2.7	
108-90-7	Chlorobenzene	50	U	50	2.0	
75-00-3	Chloroethane	50	U	50	3.1	
67-66-3	Chloroform	50	U	50	2.2	
74-87-3	Chloromethane	50	U	50	2.4	
110-82-7	Cyclohexane	100	U	100	2.4	
124-48-1	Dibromochloromethane	50	U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	
75-09-2	Dichloromethane	50	U	50	2.2	
100-41-4	Ethylbenzene	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 1022
Date Received: 10/14/11
Date Analyzed: 10/17/11 14:51

Sample Name: LC34-RW0008-052.0-20111013
Lab Code: R1105742-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\101711\D5283.D\

Analysis Lot: 265559
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	1300		50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	610		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1300		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	10	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	85-122	10/17/11 14:51	
Dibromofluoromethane	102	89-119	10/17/11 14:51	
Toluene-d8	104	87-121	10/17/11 14:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 1022
Date Received: 10/14/11
Date Analyzed: 10/18/11 10:01

Sample Name: LC34-RW0008-052.0-20111013
Lab Code: R1105742-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star278.run

Analysis Lot: 265794
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	7.4		5.0	
74-85-1	Ethene	71		5.0	
74-82-8	Methane	460		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: 10/13/11 1022
Date Received: 10/14/11
Date Analyzed: 10/18/11 01:08

Sample Name: LC34-RW0008-052.0-20111013
Lab Code: R1105742-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\101711\X0006516.D\

Analysis Lot: 265510
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	130	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	16	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.8	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111013 Dissolved
Lab Code: R1105742-004

Service Request: R1105742
Date Collected: 10/13/11 1022
Date Received: 10/14/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/17/11	10/22/11 00:37	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/17/11	10/22/11 00:37	
Manganese, Dissolved	6010C	15		µg/L	10	1	10/17/11	10/22/11 00:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105742-MB

Service Request: R1105742
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	10/21/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	10/14/11 16:45	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	10/15/11 10:17	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	10/14/11 16:45	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	10/27/11 10:33	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/14/11 16:45	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/14/11 16:45	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/14/11 16:45	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	10/14/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105742-MB1

Service Request: R1105742
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/17/11	10/21/11 21:30	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/17/11	10/21/11 21:30	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	10/17/11	10/21/11 21:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1105742-MB2

Service Request: R1105742
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/17/11	10/21/11 21:36	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/17/11	10/21/11 21:36	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	10/17/11	10/21/11 21:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 10/13/11/ TR0272A
 Sample Matrix: Water

Service Request: R1105742
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 10/17/11 12:22

Sample Name: Method Blank
 Lab Code: RQ1110420-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\101711\D5278.D\

Analysis Lot: 265559
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	20 U	20	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: NA
Date Received: NA
Date Analyzed: 10/17/11 12:22

Sample Name: Method Blank
Lab Code: RQ1110420-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\101711\D5278.D\

Analysis Lot: 265559
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	10/17/11 12:22	
Dibromofluoromethane	101	89-119	10/17/11 12:22	
Toluene-d8	104	87-121	10/17/11 12:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: NA
Date Received: NA
Date Analyzed: 10/18/11 08:35

Sample Name: Method Blank
Lab Code: RQ1110434-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star275.run

Analysis Lot: 265794
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Collected: NA
Date Received: NA
Date Analyzed: 10/17/11 11:24

Sample Name: Method Blank
Lab Code: RQ1110346-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\101711\X0006502.D\

Analysis Lot: 265510
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/14/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105742-LCS1			Duplicate Lab Control Sample R1105742-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.42	6.4	100	6.62	6.4	103	56 - 138	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/14/11 -
 10/27/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	0.954	1.00	95	90 - 110
Chloride	300.0	2.03	2.00	101	90 - 110
Iodide	300.0	0.940	1.00	94	90 - 110
Nitrate as Nitrogen	300.0	1.01	1.00	101	90 - 110
Sulfate	300.0	1.98	2.00	99	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.9	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.82	10.0	98	86 - 117
Nitrite as Nitrogen	300.0	0.999	1.0	100	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/21/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1105742-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Arsenic, Dissolved	6010C	36.7	40	92	80 - 120
Iron, Dissolved	6010C	1000	1000	100	80 - 120
Manganese, Dissolved	6010C	495	500	99	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 10/13/11/ TR0272A
 Sample Matrix: Water

Service Request: R1105742
 Date Analyzed: 10/17/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 265559

Lab Control Sample
 RQ1110420-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.8	20.0	94	72 - 128
1,1,2,2-Tetrachloroethane	17.1	20.0	85	72 - 131
1,1,2-Trichloroethane	19.7	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.7	20.0	94	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.7	20.0	93	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.8	20.0	94	72 - 129
1,2,4-Trichlorobenzene	18.1	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.3	20.0	91	62 - 131
1,2-Dibromoethane	18.1	20.0	91	78 - 125
1,2-Dichlorobenzene	18.4	20.0	92	79 - 124
1,2-Dichloroethane	19.1	20.0	96	73 - 127
1,2-Dichloropropane	18.9	20.0	94	80 - 123
1,3-Dichlorobenzene	18.4	20.0	92	78 - 124
1,4-Dichlorobenzene	18.0	20.0	90	78 - 123
n-Butanol	1070	1000	107	70 - 130
2-Butanone (MEK)	16.9	20.0	85	60 - 133
2-Hexanone	16.9	20.0	84	61 - 131
4-Methyl-2-pentanone	17.9	20.0	90	61 - 132
Acetone	18.2	20.0	91	54 - 139
Benzene	18.8	20.0	94	78 - 121
Bromodichloromethane	19.8	20.0	99	80 - 125
Bromoform	20.4	20.0	102	68 - 130
Bromomethane	13.2	20.0	66	57 - 144
Carbon Disulfide	18.9	20.0	94	52 - 140
Carbon Tetrachloride	20.3	20.0	102	68 - 133
Chlorobenzene	18.7	20.0	93	80 - 121
Chloroethane	19.5	20.0	97	71 - 130
Chloroform	19.3	20.0	96	78 - 125
Chloromethane	16.6	20.0	83	61 - 138
Cyclohexane	13.4	20.0	67	57 - 126
Dibromochloromethane	20.0	20.0	100	78 - 133
Dichlorodifluoromethane (CFC 12)	16.7	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/17/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 265559

**Lab Control Sample
 RQ1110420-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.5	20.0	92	75 - 125
Ethylbenzene	18.8	20.0	94	78 - 123
Isopropylbenzene (Cumene)	20.6	20.0	103	73 - 133
Methyl Acetate	16.6	20.0	83	57 - 157
Methyl tert-Butyl Ether	18.2	20.0	91	75 - 126
Methylcyclohexane	15.5	20.0	77	61 - 125
Styrene	19.3	20.0	96	80 - 132
Tetrachloroethene (PCE)	19.6	20.0	98	72 - 131
Toluene	19.4	20.0	97	78 - 122
Trichloroethene (TCE)	20.1	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	20.6	20.0	103	69 - 141
Vinyl Chloride	19.1	20.0	96	72 - 138
cis-1,2-Dichloroethene	19.9	20.0	99	78 - 122
cis-1,3-Dichloropropene	18.5	20.0	92	77 - 125
m,p-Xylenes	38.2	40.0	95	79 - 126
n-Butyl Acetate	14.8	20.0	74	31 - 144
o-Xylene	19.2	20.0	96	77 - 118
trans-1,2-Dichloroethene	18.9	20.0	94	75 - 121
trans-1,3-Dichloropropene	18.8	20.0	94	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/18/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 265794

Analyte Name	Lab Control Sample RQ1110434-02			Duplicate Lab Control Sample RQ1110434-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	27.5	26.0	106	26.3	26.0	101	56 - 148	4	30
Ethene	22.8	24.3	94	23.3	24.3	96	58 - 155	2	30
Methane	27.3	26.2	104	26.4	26.2	100	55 - 150	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 10/13/11/ TR0272A
Sample Matrix: Water

Service Request: R1105742
Date Analyzed: 10/17/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 265510

Analyte Name	Lab Control Sample RQ1110346-02			Duplicate Lab Control Sample RQ1110346-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.04	1.00	104	1.04	1.00	104	70 - 130	<1	30
Acetic Acid	9.97	10.0	100	9.94	10.0	99	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.12	10.0	91	10.4	10.0	104	78 - 113	13	30
Lactic Acid	8.77	9.97	88	8.92	9.97	89	61 - 109	2	30
Propionic Acid	10.3	9.97	103	10.3	9.97	104	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:
 Sampler's Signature: *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-20111013	10/13/11	0944	-001-002	W	15	3	2	1	1	1	3	1	1	
LC34-RW0008-052.0-20111013	10/13/11	1022	-003-004	W	15	3	2	1	3	1	3	1	1	
LC34-TD-2011-3B														

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

Comments/Special Instructions:
 Please filter dissolved metals to lab.

R1105742
 Geosyntec Consultants
 ESTCP PED LC34 10/13/11



RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Daniel Ward
 Firm: CAS
 Date/Time: 10/14/11 / 0818

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Repta
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: Joselyn Bostwick
 Firm: Geosyntec
 Date/Time: 10/13/11 - 1630

Cooler Receipt And Preservation Check Form

Project/Client Geosyntec Folder Number 21105742

Cooler received on 10/14/11 by: DLW COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did ~~VOA~~ vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A ✓
5. Were ~~Ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 2.4

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 10/14/11/0950

Thermometer ID: ~~IR GUN#3~~ / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 10/14/11

Cooler Breakdown: Date: 10/14/11 Time: 1045 by: DLW

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>W6103155D</u>	<u>8/12</u>				
Residual Chlorine (-)	For TCN and Phenol			If present, contact PM to add ascorbic acid					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	<u>4110060</u>	<u>8/12</u>				

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust:

Bottle lot numbers: 1-087-002, 1-132-001, 053011-2V

Other Comments: *1 vial for LC34-RW0007 CRSK (75)

PC Secondary Review: KB 10/31/11

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

November 16, 2011

Service Request No: R1106024

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272 10/25-27/11

Dear Mr. Repta:

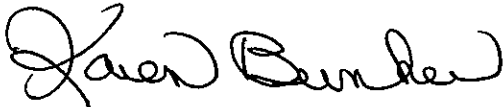
Enclosed are the results of the sample(s) submitted to our laboratory between October 26, 2011 and October 28, 2011. For your reference, these analyses have been assigned our service request number **R1106024**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 256

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 10/25-27/11
Sample Matrix: Water

Service Request No.: R1106024
Date Received: 10/26-28/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Thirty-six (36) water samples including three (3) Trip Blanks were collected by the client over the period from 10/25-27/11 and were received for analysis at Columbia Analytical Services from 10/26-28/11 via a national courier. The samples were received at a cooler temperature range from 1.2 - 6.0°C within the guidelines of 0-6°C. Any breakage or headspace noted upon sample receipt is noted on the Cooler Receipt and Preservation form immediately following the associated chain of custody near the end of the report.

Volatile Organic Compounds GC/MS

Thirty-six (36) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for the Continuing Calibration Verification %D which was outside limits of $\pm 20\%$ for 1,1,2,2-Tetrachloroethane (-20.5%) and Bromomethane (-22.0%) on the 10/29/11 analytical run. Any hits in samples associated with these hits should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Site QC is included in the report for locations LC34-BW0001B-031.5-2011025 and LC34-RW0008-052.0-2011026 (CAS #R1106024-005 and -036 respectively). All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within acceptance limits except for the following:

- 1,1,2-Trichloro-1,2,2-trifluoroethane (MS/MSD) outside limits low
- Trichloroethene (MS/MSD) outside limits low
- Cis-1,2-Dichloroethene (MS) outside limits low.

Matrix interference is suspected. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date

11/17/11

Volatile Organics GC

Twenty-five (25) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Site QC is included in the report for locations LC34-BW0001C-038.5-2011025 and LC34-BW0003E-052.5-2011027 (CAS # R1106024-007 and -046 respectively) for RSK-175 and locations LC34-IW0076-075.0-2011025, LC34-RW0007-038.5-2011026, and LC34-BW0003C-038.5-2011027 (CAS # R1106024-001,-034 and -045 respectively) for Organic Acids. All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within acceptance limits. Acetic Acid and Butanoic Acid were spiked too low to be accurately determined (less than 4X the concentration in the samples). The recoveries have been flagged as "#". The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limits except for n-Butanol on the 10/29/11 run which was outside limits high. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination except for n-Butanol on the 10/29/11 analytical run. Any affected data is flagged as "B".

No other analytical or QC problems were encountered.

Inorganic Parameters

Twenty-four (24) water samples were analyzed for Bromide and Iodide by IC method 300.0 and TOC by method 9060A. Thirteen (13) water samples were analyzed for Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. Twelve (12) water samples were analyzed for dissolved metals by ICP method 6010C. These soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Site QC is included in the report for all analytes except Sulfide which had insufficient sample volume available for site specific analysis. An LCS and LCSD were done on this parameter. All Matrix Spike (MS) recoveries were within acceptance limits except for Sulfate MS and MSD and Chloride and Iodide MS recoveries which were outside limits low. The recoveries are flagged as "*". Matrix interference is suspected. All Relative Percent Difference (RPD) calculations were acceptable. All LCS and LCSD (Sulfide) recoveries were within QC limits.

All samples were analyzed within holding times for these analyses except for Nitrite analysis which were repeated hours outside of the 48 hour holding time for 11 of the 13 samples due to an interfering Chloride peak on the initial analysis. Only the reanalysis date has been reported. The data has been flagged as "*" for the holding time exceedences. Permission has been given by the client to run future samples by an alternative method to avoid this interference.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by Karen Benhe Date 11/17/11

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1106024

<u>Lab ID</u>	<u>Client ID</u>
R1106024-001	LC34-IW0076-075.0-20111025
R1106024-002	LC34-IW0076-075.0-20111025 Dissolved
R1106024-003	LC34-BW0001A-024.5-20111025
R1106024-004	LC34-BW0001A-024.5-20111025 Dissolved
R1106024-005	LC34-BW0001B-031.5-20111025
R1106024-006	LC34-BW0001B-031.5-20111025 Dissolved
R1106024-007	LC34-BW0001C-038.5-20111025
R1106024-008	LC34-BW0001C-038.5-20111025 Dissolved
R1106024-009	LC34-BW0001D-045.5-20111025
R1106024-010	LC34-BW0001D-045.5-20111025 Dissolved
R1106024-011	LC34-BW0001E-052.5-20111025
R1106024-012	LC34-BW0001E-052.5-20111025 Dissolved
R1106024-013	LC34-BW0001F-059.5-20111025
R1106024-014	LC34-BW0001F-059.5-20111025 Dissolved
R1106024-015	LC34-IW0067D-040.5-20111025
R1106024-016	LC34-IW0067D1-068.0-20111025
R1106024-017	LC34-IW0070D-040.5-20111025
R1106024-018	LC34-IW0070D1-070.0-20111025
R1106024-019	LC34-IW0071D-040.5-20111025
R1106024-020	LC34-IW0071D1-070.0-20111025
R1106024-024	LC34-TB-20111025
R1106024-025	LC34-BW0002A-024.5-20111026
R1106024-026	LC34-BW0002B-031.5-20111026
R1106024-027	LC34-BW0002C-038.5-20111026
R1106024-028	LC34-BW0002D-045.5-20111026
R1106024-029	LC34-BW0002E-052.0-20111026
R1106024-030	LC34-BW0002F-059.5-20111026
R1106024-031	LC34-BW0003A-024.5-20111026
R1106024-032	LC34-BW0003D-045.5-20111026
R1106024-033	LC34-TB-20111026
R1106024-034	LC34-RW0007-038.5-20111026
R1106024-035	LC34-RW0007-038.5-20111026 Dissolved
R1106024-036	LC34-RW0008-052.0-20111026
R1106024-037	LC34-RW0008-052.0-20111026 Dissolved
R1106024-038	LC34-IW0002I-027.5-20111026
R1106024-039	LC34-IW0002I-027.5-20111026 Dissolved
R1106024-040	LC34-IW0002D-037.5-20111026
R1106024-041	LC34-IW0002D-037.5-20111026 Dissolved
R1106024-042	LC34-IW0002D1-052.5-20111026
R1106024-043	LC34-IW0002D1-052.5-20111026 Dissolved
R1106024-044	LC34-BW0003B-031.5-20111027
R1106024-045	LC34-BW0003C-038.5-20111027
R1106024-046	LC34-BW0003E-052.5-20111027
R1106024-047	LC34-BW0003F-059.5-20111027

00004rev

Lab ID
R1106024-048

Client ID
LC34-TB-20111027

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20111025
Lab Code: R1106024-001

Service Request: R1106024
Date Collected: 10/25/11 1502
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.5	mg/L	1.0	10	NA	11/4/11 18:05	
Carbon, Total Organic (TOC), Average	9060A	4.7	mg/L	1.0	1	NA	10/31/11 15:36	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 11:42	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20111025 Dissolved
Lab Code: R1106024-002

Service Request: R1106024
Date Collected: 10/25/11 1502
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 20:55	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/11/11 20:55	
Manganese, Dissolved	6010C	13		µg/L	10	1	10/31/11	11/11/11 20:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0076-075.0-20111025
 Lab Code: R1106024-001

Service Request: R1106024
 Date Collected: 10/25/11 1502
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/30/11 13:07		267361	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/30/11 13:07		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	54		5.0	0.31	1	NA	10/30/11 13:07		267361	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,1-Dichloroethene (1,1-DCE)	0.34	I	5.0	0.29	1	NA	10/30/11 13:07		267361	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/30/11 13:07		267361	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/30/11 13:07		267361	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/30/11 13:07		267361	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
n-Butanol	90	I	250	11	1	NA	10/30/11 13:07		267361	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/30/11 13:07		267361	
2-Hexanone	10	U	10	0.35	1	NA	10/30/11 13:07		267361	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/30/11 13:07		267361	
Acetone	20	U	20	0.98	1	NA	10/30/11 13:07		267361	
Benzene	5.0	U	5.0	0.21	1	NA	10/30/11 13:07		267361	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Bromoform	5.0	U	5.0	0.27	1	NA	10/30/11 13:07		267361	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/30/11 13:07		267361	
Carbon Disulfide	10	U	10	0.20	1	NA	10/30/11 13:07		267361	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/30/11 13:07		267361	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/30/11 13:07		267361	
Chloroform	5.0	U	5.0	0.22	1	NA	10/30/11 13:07		267361	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/30/11 13:07		267361	
Cyclohexane	10	U	10	0.24	1	NA	10/30/11 13:07		267361	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/30/11 13:07		267361	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/30/11 13:07		267361	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Methyl Acetate	10	U	10	0.23	1	NA	10/30/11 13:07		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20111025
Lab Code: R1106024-001

Service Request: R1106024
Date Collected: 10/25/11 1502
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Methylcyclohexane	10	U	10	0.25	1	NA	10/30/11 13:07		267361	
Styrene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Toluene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Trichloroethene (TCE)	0.27	I	5.0	0.23	1	NA	10/30/11 13:07		267361	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
Vinyl Chloride	5.0		5.0	0.23	1	NA	10/30/11 13:07		267361	
cis-1,2-Dichloroethene	110		5.0	0.20	1	NA	10/30/11 13:07		267361	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/30/11 13:07		267361	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	
trans-1,2-Dichloroethene	4.0	I	5.0	0.20	1	NA	10/30/11 13:07		267361	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 13:07		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/30/11 13:07	
Dibromofluoromethane	102	89-119	10/30/11 13:07	
Toluene-d8	105	87-121	10/30/11 13:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20111025
Lab Code: R1106024-001

Service Request: R1106024
Date Collected: 10/25/11 1502
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/3/11 14:44		268117	
Ethene	1.0	U	1.0	1	NA	11/3/11 14:44		268117	
Methane	790		20	10	NA	11/3/11 14:54		268117	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1502
Date Received: 10/26/11
Date Analyzed: 11/8/11 04:41

Sample Name: LC34-IW0076-075.0-20111025
Lab Code: R1106024-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\110711\X0006668.D\

Analysis Lot: 268467
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	12	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	13	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20111025
Lab Code: R1106024-003

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	299		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 20:06	
Carbon, Total Organic (TOC), Average	9060A	7.2		mg/L	1.0	1	NA	10/31/11 16:16	
Chloride	300.0	76.4		mg/L	2.0	10	NA	10/26/11 20:06	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	10/27/11 11:51	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 20:06	
Nitrite as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 20:06	
Sulfate	300.0	49.6		mg/L	2.0	10	NA	10/26/11 20:06	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20111025 Dissolved
Lab Code: R1106024-004

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 21:06	
Iron, Dissolved	6010C	130		µg/L	100	1	10/31/11	11/11/11 21:06	
Manganese, Dissolved	6010C	24		µg/L	10	1	10/31/11	11/11/11 21:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20111025
Lab Code: R1106024-003

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	10/30/11 13:37		267361	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	10/30/11 13:37		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	59000		2500	160	500	NA	10/31/11 15:49		267468	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	10/30/11 13:37		267361	
1,2,4-Trichlorobenzene	73	I	1300	65	250	NA	10/30/11 13:37		267361	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	10/30/11 13:37		267361	
1,2-Dibromoethane	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,2-Dichloroethane	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,2-Dichloropropane	1300	U	1300	70	250	NA	10/30/11 13:37		267361	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
n-Butanol	63000	U	63000	2700	250	NA	10/30/11 13:37		267361	
2-Butanone (MEK)	2500	U	2500	130	250	NA	10/30/11 13:37		267361	
2-Hexanone	2500	U	2500	88	250	NA	10/30/11 13:37		267361	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	10/30/11 13:37		267361	
Acetone	5000	U	5000	250	250	NA	10/30/11 13:37		267361	
Benzene	1300	U	1300	53	250	NA	10/30/11 13:37		267361	
Bromodichloromethane	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Bromoform	1300	U	1300	68	250	NA	10/30/11 13:37		267361	
Bromomethane	1300	U	1300	78	250	NA	10/30/11 13:37		267361	
Carbon Disulfide	2500	U	2500	50	250	NA	10/30/11 13:37		267361	
Carbon Tetrachloride	1300	U	1300	68	250	NA	10/30/11 13:37		267361	
Chlorobenzene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Chloroethane	1300	U	1300	78	250	NA	10/30/11 13:37		267361	
Chloroform	1300	U	1300	55	250	NA	10/30/11 13:37		267361	
Chloromethane	1300	U	1300	60	250	NA	10/30/11 13:37		267361	
Cyclohexane	2500	U	2500	60	250	NA	10/30/11 13:37		267361	
Dibromochloromethane	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	10/30/11 13:37		267361	
Dichloromethane	1300	U	1300	55	250	NA	10/30/11 13:37		267361	
Ethylbenzene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Methyl Acetate	2500	U	2500	58	250	NA	10/30/11 13:37		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20111025
Lab Code: R1106024-003

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Methylcyclohexane	2500	U	2500	63	250	NA	10/30/11 13:37		267361	
Styrene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Toluene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Trichloroethene (TCE)	130	I	1300	58	250	NA	10/30/11 13:37		267361	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
Vinyl Chloride	2400		1300	58	250	NA	10/30/11 13:37		267361	
cis-1,2-Dichloroethene	45000		1300	50	250	NA	10/30/11 13:37		267361	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
m,p-Xylenes	50	I	1300	50	250	NA	10/30/11 13:37		267361	
n-Butyl Acetate	1300	U	1300	53	250	NA	10/30/11 13:37		267361	
o-Xylene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	
trans-1,2-Dichloroethene	1100	I	1300	50	250	NA	10/30/11 13:37		267361	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/30/11 13:37		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/30/11 13:37	
Dibromofluoromethane	102	89-119	10/30/11 13:37	
Toluene-d8	104	87-121	10/30/11 13:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20111025
Lab Code: R1106024-003

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	3.9		1.0	1	NA	11/3/11 15:03		268117	
Ethene	35		1.0	1	NA	11/3/11 15:03		268117	
Methane	83		2.0	1	NA	11/3/11 15:03		268117	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 0955
Date Received: 10/26/11
Date Analyzed: 11/8/11 10:21

Sample Name: LC34-BW0001A-024.5-20111025
Lab Code: R1106024-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\110711\X0006674.D\

Analysis Lot: 268467
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	11	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	880	mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	50.6	mg/L	2.0	20	NA	10/27/11 23:27	
Carbon, Total Organic (TOC), Average	9060A	760	mg/L	100	100	NA	11/2/11 17:58	
Chloride	300.0	119	mg/L	4.0	20	NA	10/27/11 23:27	
Iodide	300.0	89.1	mg/L	6.0	30	NA	10/27/11 15:47	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	10/26/11 20:18	
Nitrite as Nitrogen	300.0	2.0 U	mg/L	2.0	20	NA	10/27/11 23:27	*
Sulfate	300.0	19.7	mg/L	2.0	10	NA	10/26/11 20:18	
Sulfide, Total	SM 4500-S2- F	2.1	mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20111025 Dissolved
Lab Code: R1106024-006

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/11/11 21:11	
Iron, Dissolved	6010C	380	µg/L	100	1	10/31/11	11/11/11 21:11	
Manganese, Dissolved	6010C	43	µg/L	10	1	10/31/11	11/11/11 21:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	10/30/11 14:06		267361	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	10/30/11 14:06		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	68000		5000	310	1000	NA	10/31/11 20:19		267468	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	10/30/11 14:06		267361	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	10/30/11 14:06		267361	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	10/30/11 14:06		267361	
1,2-Dibromoethane	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,2-Dichloroethane	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,2-Dichloropropane	2500	U	2500	140	500	NA	10/30/11 14:06		267361	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
n-Butanol	1400000		130000	5300	500	NA	10/30/11 14:06		267361	
2-Butanone (MEK)	5000	U	5000	260	500	NA	10/30/11 14:06		267361	
2-Hexanone	5000	U	5000	180	500	NA	10/30/11 14:06		267361	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	10/30/11 14:06		267361	
Acetone	10000	U	10000	490	500	NA	10/30/11 14:06		267361	
Benzene	2500	U	2500	110	500	NA	10/30/11 14:06		267361	
Bromodichloromethane	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Bromoform	2500	U	2500	140	500	NA	10/30/11 14:06		267361	
Bromomethane	2500	U	2500	160	500	NA	10/30/11 14:06		267361	
Carbon Disulfide	5000	U	5000	100	500	NA	10/30/11 14:06		267361	
Carbon Tetrachloride	2500	U	2500	140	500	NA	10/30/11 14:06		267361	
Chlorobenzene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Chloroethane	2500	U	2500	160	500	NA	10/30/11 14:06		267361	
Chloroform	2500	U	2500	110	500	NA	10/30/11 14:06		267361	
Chloromethane	2500	U	2500	120	500	NA	10/30/11 14:06		267361	
Cyclohexane	5000	U	5000	120	500	NA	10/30/11 14:06		267361	
Dibromochloromethane	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	10/30/11 14:06		267361	
Dichloromethane	2500	U	2500	110	500	NA	10/30/11 14:06		267361	
Ethylbenzene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Methyl Acetate	5000	U	5000	120	500	NA	10/30/11 14:06		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Methylcyclohexane	5000	U	5000	130	500	NA	10/30/11 14:06		267361	
Styrene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Toluene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Trichloroethene (TCE)	3200		2500	120	500	NA	10/30/11 14:06		267361	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
Vinyl Chloride	1100	I	2500	120	500	NA	10/30/11 14:06		267361	
cis-1,2-Dichloroethene	12000		2500	100	500	NA	10/30/11 14:06		267361	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
m,p-Xylenes	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
n-Butyl Acetate	56000		2500	110	500	NA	10/30/11 14:06		267361	
o-Xylene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	
trans-1,2-Dichloroethene	260	I	2500	100	500	NA	10/30/11 14:06		267361	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/30/11 14:06		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/30/11 14:06	
Dibromofluoromethane	101	89-119	10/30/11 14:06	
Toluene-d8	106	87-121	10/30/11 14:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	6.5		1.0	1	NA	11/4/11 10:25		268312	
Ethene	12		1.0	1	NA	11/4/11 10:25		268312	
Methane	23		2.0	1	NA	11/4/11 10:25		268312	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1055
Date Received: 10/26/11
Date Analyzed: 11/9/11 20:41

Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006705.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	5.0 U	5.0	
64-19-7	Acetic Acid	970	10	
107-92-6	Butanoic Acid (Butyric Acid)	180	20	
50-21-5	Lactic Acid	10 U	10	
79-09-4	Propionic Acid	10 U	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	718		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	40.2		mg/L	1.0	10	NA	10/26/11 21:08	
Carbon, Total Organic (TOC), Average	9060A	511		mg/L	40	40	NA	10/31/11 16:56	
Chloride	300.0	287		mg/L	10	50	NA	10/27/11 23:41	
Iodide	300.0	39.9		mg/L	2.0	10	NA	10/27/11 12:08	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 21:08	
Nitrite as Nitrogen	300.0	5.0	U	mg/L	5.0	50	NA	10/27/11 23:41	*
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	10/26/11 21:08	
Sulfide, Total	SM 4500-S2- F	9.0		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20111025 Dissolved
Lab Code: R1106024-008

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 21:26	
Iron, Dissolved	6010C	120		µg/L	100	1	10/31/11	11/11/11 21:26	
Manganese, Dissolved	6010C	39		µg/L	10	1	10/31/11	11/11/11 21:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	10/28/11 20:27		267265	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	10/28/11 20:27		267265	
1,1,2-Trichloro-1,2,2-trifluoroethane	98000		2500	160	500	NA	10/28/11 20:27		267265	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	10/28/11 20:27		267265	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	10/28/11 20:27		267265	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	10/28/11 20:27		267265	
1,2-Dibromoethane	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,2-Dichloroethane	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,2-Dichloropropane	2500	U	2500	140	500	NA	10/28/11 20:27		267265	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
n-Butanol	200000		130000	5300	500	NA	10/28/11 20:27		267265	
2-Butanone (MEK)	5000	U	5000	260	500	NA	10/28/11 20:27		267265	
2-Hexanone	5000	U	5000	180	500	NA	10/28/11 20:27		267265	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	10/28/11 20:27		267265	
Acetone	10000	U	10000	490	500	NA	10/28/11 20:27		267265	
Benzene	2500	U	2500	110	500	NA	10/28/11 20:27		267265	
Bromodichloromethane	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Bromoform	2500	U	2500	140	500	NA	10/28/11 20:27		267265	
Bromomethane	2500	U	2500	160	500	NA	10/28/11 20:27		267265	
Carbon Disulfide	5000	U	5000	100	500	NA	10/28/11 20:27		267265	
Carbon Tetrachloride	2500	U	2500	140	500	NA	10/28/11 20:27		267265	
Chlorobenzene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Chloroethane	2500	U	2500	160	500	NA	10/28/11 20:27		267265	
Chloroform	2500	U	2500	110	500	NA	10/28/11 20:27		267265	
Chloromethane	2500	U	2500	120	500	NA	10/28/11 20:27		267265	
Cyclohexane	5000	U	5000	120	500	NA	10/28/11 20:27		267265	
Dibromochloromethane	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	10/28/11 20:27		267265	
Dichloromethane	2500	U	2500	110	500	NA	10/28/11 20:27		267265	
Ethylbenzene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Methyl Acetate	5000	U	5000	120	500	NA	10/28/11 20:27		267265	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Methylcyclohexane	5000	U	5000	130	500	NA	10/28/11 20:27		267265	
Styrene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Toluene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Trichloroethene (TCE)	12000		2500	120	500	NA	10/28/11 20:27		267265	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
Vinyl Chloride	1300	I	2500	120	500	NA	10/28/11 20:27		267265	
cis-1,2-Dichloroethene	22000		2500	100	500	NA	10/28/11 20:27		267265	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
m,p-Xylenes	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
n-Butyl Acetate	2500	U	2500	110	500	NA	10/28/11 20:27		267265	
o-Xylene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	
trans-1,2-Dichloroethene	270	I	2500	100	500	NA	10/28/11 20:27		267265	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/28/11 20:27		267265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	10/28/11 20:27	
Dibromofluoromethane	100	89-119	10/28/11 20:27	
Toluene-d8	103	87-121	10/28/11 20:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	57		1.0	1	NA	11/3/11 15:14		268117	
Ethene	10		1.0	1	NA	11/3/11 15:14		268117	
Methane	64		2.0	1	NA	11/3/11 15:14		268117	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1141
Date Received: 10/26/11
Date Analyzed: 11/9/11 22:35

Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006707.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	2.5	U	2.5	
64-19-7	Acetic Acid	480		5.0	
107-92-6	Butanoic Acid (Butyric Acid)	530		10	
50-21-5	Lactic Acid	5.0	U	5.0	
79-09-4	Propionic Acid	12		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20111025
Lab Code: R1106024-009

Service Request: R1106024
Date Collected: 10/25/11 1440
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	436		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	12.7		mg/L	1.0	10	NA	10/26/11 21:20	
Carbon, Total Organic (TOC), Average	9060A	241		mg/L	20	20	NA	10/31/11 17:36	
Chloride	300.0	568		mg/L	20	100	NA	10/27/11 23:55	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	10/27/11 12:16	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 21:20	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	10/27/11 23:55	*
Sulfate	300.0	69.0		mg/L	2.0	10	NA	10/26/11 21:20	
Sulfide, Total	SM 4500-S2- F	2.8		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20111025 Dissolved
Lab Code: R1106024-010

Service Request: R1106024
Date Collected: 10/25/11 1440
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 21:31	
Iron, Dissolved	6010C	230		µg/L	100	1	10/31/11	11/11/11 21:31	
Manganese, Dissolved	6010C	41		µg/L	10	1	10/31/11	11/11/11 21:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0001D-045.5-20111025
 Lab Code: R1106024-009

Service Request: R1106024
 Date Collected: 10/25/11 1440
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5000	U	5000	230	1000	NA	10/28/11 20:57		267265	
1,1,2,2-Tetrachloroethane	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,1,2-Trichloroethane	5000	U	5000	230	1000	NA	10/28/11 20:57		267265	
1,1,2-Trichloro-1,2,2-trifluoroethane	63000		5000	310	1000	NA	10/28/11 20:57		267265	
1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	1000	NA	10/28/11 20:57		267265	
1,2,4-Trichlorobenzene	5000	U	5000	260	1000	NA	10/28/11 20:57		267265	
1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	1000	NA	10/28/11 20:57		267265	
1,2-Dibromoethane	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,2-Dichlorobenzene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,2-Dichloroethane	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,2-Dichloropropane	5000	U	5000	280	1000	NA	10/28/11 20:57		267265	
1,3-Dichlorobenzene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
1,4-Dichlorobenzene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
n-Butanol	310000		250000	11000	1000	NA	10/28/11 20:57		267265	
2-Butanone (MEK)	10000	U	10000	510	1000	NA	10/28/11 20:57		267265	
2-Hexanone	10000	U	10000	350	1000	NA	10/28/11 20:57		267265	
4-Methyl-2-pentanone	10000	U	10000	270	1000	NA	10/28/11 20:57		267265	
Acetone	20000	U	20000	980	1000	NA	10/28/11 20:57		267265	
Benzene	5000	U	5000	210	1000	NA	10/28/11 20:57		267265	
Bromodichloromethane	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Bromoform	5000	U	5000	270	1000	NA	10/28/11 20:57		267265	
Bromomethane	5000	U	5000	310	1000	NA	10/28/11 20:57		267265	
Carbon Disulfide	10000	U	10000	200	1000	NA	10/28/11 20:57		267265	
Carbon Tetrachloride	5000	U	5000	270	1000	NA	10/28/11 20:57		267265	
Chlorobenzene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Chloroethane	5000	U	5000	310	1000	NA	10/28/11 20:57		267265	
Chloroform	5000	U	5000	220	1000	NA	10/28/11 20:57		267265	
Chloromethane	5000	U	5000	240	1000	NA	10/28/11 20:57		267265	
Cyclohexane	10000	U	10000	240	1000	NA	10/28/11 20:57		267265	
Dibromochloromethane	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	1000	NA	10/28/11 20:57		267265	
Dichloromethane	5000	U	5000	220	1000	NA	10/28/11 20:57		267265	
Ethylbenzene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Isopropylbenzene (Cumene)	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Methyl Acetate	10000	U	10000	230	1000	NA	10/28/11 20:57		267265	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20111025
Lab Code: R1106024-009

Service Request: R1106024
Date Collected: 10/25/11 1440
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Methylcyclohexane	10000	U	10000	250	1000	NA	10/28/11 20:57		267265	
Styrene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Tetrachloroethene (PCE)	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Toluene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Trichloroethene (TCE)	150000		5000	230	1000	NA	10/28/11 20:57		267265	
Trichlorofluoromethane (CFC 11)	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
Vinyl Chloride	5000	U	5000	230	1000	NA	10/28/11 20:57		267265	
cis-1,2-Dichloroethene	3000	I	5000	200	1000	NA	10/28/11 20:57		267265	
cis-1,3-Dichloropropene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
m,p-Xylenes	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
n-Butyl Acetate	270000		13000	530	2500	NA	10/31/11 19:49		267468	
o-Xylene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
trans-1,2-Dichloroethene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	
trans-1,3-Dichloropropene	5000	U	5000	200	1000	NA	10/28/11 20:57		267265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/28/11 20:57	
Dibromofluoromethane	102	89-119	10/28/11 20:57	
Toluene-d8	106	87-121	10/28/11 20:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20111025
Lab Code: R1106024-009

Service Request: R1106024
Date Collected: 10/25/11 1440
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	99		2.0	2	NA	11/4/11 11:04		268312	
Ethene	3.5		1.0	1	NA	11/4/11 10:35		268312	
Methane	13		2.0	1	NA	11/4/11 10:35		268312	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1440
Date Received: 10/26/11
Date Analyzed: 11/11/11 01:55

Sample Name: LC34-BW0001D-045.5-20111025
Lab Code: R1106024-009

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006736.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	340	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	29	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20111025
Lab Code: R1106024-011

Service Request: R1106024
Date Collected: 10/25/11 1400
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	299		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	4.8		mg/L	1.0	10	NA	10/26/11 21:58	
Carbon, Total Organic (TOC), Average	9060A	79		mg/L	10	10	NA	10/31/11 18:16	
Chloride	300.0	625		mg/L	20	100	NA	10/27/11 22:17	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	10/27/11 12:41	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/26/11 21:58	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	10/27/11 22:17	*
Sulfate	300.0	16.8		mg/L	2.0	10	NA	10/26/11 21:58	
Sulfide, Total	SM 4500-S2- F	9.3		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20111025 Dissolved
Lab Code: R1106024-012

Service Request: R1106024
Date Collected: 10/25/11 1400
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 21:37	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/11/11 21:37	
Manganese, Dissolved	6010C	18		µg/L	10	1	10/31/11	11/11/11 21:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0001E-052.5-20111025
 Lab Code: R1106024-011

Service Request: R1106024
 Date Collected: 10/25/11 1400
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.2	5	NA	10/31/11 16:19		267468	
1,1,2,2-Tetrachloroethane	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,1,2-Trichloroethane	25	U	25	1.2	5	NA	10/31/11 16:19		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	110		25	1.6	5	NA	10/31/11 16:19		267468	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,1-Dichloroethene (1,1-DCE)	25	U	25	1.5	5	NA	10/31/11 16:19		267468	
1,2,4-Trichlorobenzene	25	U	25	1.3	5	NA	10/31/11 16:19		267468	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	5	NA	10/31/11 16:19		267468	
1,2-Dibromoethane	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,2-Dichlorobenzene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,2-Dichloroethane	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,2-Dichloropropane	25	U	25	1.5	5	NA	10/31/11 16:19		267468	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
n-Butanol	1300	U	1300	53	5	NA	10/31/11 16:19		267468	
2-Butanone (MEK)	50	U	50	2.6	5	NA	10/31/11 16:19		267468	
2-Hexanone	50	U	50	1.8	5	NA	10/31/11 16:19		267468	
4-Methyl-2-pentanone	50	U	50	1.4	5	NA	10/31/11 16:19		267468	
Acetone	100	U	100	4.9	5	NA	10/31/11 16:19		267468	
Benzene	25	U	25	1.1	5	NA	10/31/11 16:19		267468	
Bromodichloromethane	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Bromoform	25	U	25	1.4	5	NA	10/31/11 16:19		267468	
Bromomethane	25	U	25	1.6	5	NA	10/31/11 16:19		267468	
Carbon Disulfide	50	U	50	1.0	5	NA	10/31/11 16:19		267468	
Carbon Tetrachloride	25	U	25	1.4	5	NA	10/31/11 16:19		267468	
Chlorobenzene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Chloroethane	25	U	25	1.6	5	NA	10/31/11 16:19		267468	
Chloroform	25	U	25	1.1	5	NA	10/31/11 16:19		267468	
Chloromethane	25	U	25	1.2	5	NA	10/31/11 16:19		267468	
Cyclohexane	50	U	50	1.2	5	NA	10/31/11 16:19		267468	
Dibromochloromethane	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	5	NA	10/31/11 16:19		267468	
Dichloromethane	25	U	25	1.1	5	NA	10/31/11 16:19		267468	
Ethylbenzene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Methyl Acetate	50	U	50	1.2	5	NA	10/31/11 16:19		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20111025
Lab Code: R1106024-011

Service Request: R1106024
Date Collected: 10/25/11 1400
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Methylcyclohexane	50	U	50	1.3	5	NA	10/31/11 16:19		267468	
Styrene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Toluene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Trichloroethene (TCE)	230		25	1.2	5	NA	10/31/11 16:19		267468	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
Vinyl Chloride	110		25	1.2	5	NA	10/31/11 16:19		267468	
cis-1,2-Dichloroethene	470		25	1.0	5	NA	10/31/11 16:19		267468	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
m,p-Xylenes	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
n-Butyl Acetate	25	U	25	1.1	5	NA	10/31/11 16:19		267468	
o-Xylene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	
trans-1,2-Dichloroethene	3.6	I	25	1.0	5	NA	10/31/11 16:19		267468	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	10/31/11 16:19		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	10/31/11 16:19	
Dibromofluoromethane	104	89-119	10/31/11 16:19	
Toluene-d8	103	87-121	10/31/11 16:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20111025
Lab Code: R1106024-011

Service Request: R1106024
Date Collected: 10/25/11 1400
Date Received: 10/26/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	6.9		1.0	1	NA	11/4/11 10:45		268312	
Ethene	110		2.0	2	NA	11/4/11 10:55		268312	
Methane	95		2.0	1	NA	11/4/11 10:45		268312	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1400
Date Received: 10/26/11
Date Analyzed: 11/8/11 18:50

Sample Name: LC34-BW0001E-052.5-20111025
Lab Code: R1106024-011

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\110711\X0006683.D\

Analysis Lot: 268467
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	140	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	34	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	3.5	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	169	mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	1.6	mg/L	1.0	10	NA	10/26/11 22:10	
Carbon, Total Organic (TOC), Average	9060A	4.4	mg/L	1.0	1	NA	11/2/11 18:38	
Chloride	300.0	670	mg/L	20	100	NA	10/27/11 22:31	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 12:49	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	10/26/11 22:10	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	10/27/11 22:31	*
Sulfate	300.0	103	mg/L	4.0	20	NA	10/31/11 23:53	
Sulfide, Total	SM 4500-S2- F	1.1	mg/L	1.0	1	NA	10/28/11 10:00	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20111025 Dissolved
Lab Code: R1106024-014

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/11/11 21:43	
Iron, Dissolved	6010C	130		µg/L	100	1	10/31/11	11/11/11 21:43	
Manganese, Dissolved	6010C	13		µg/L	10	1	10/31/11	11/11/11 21:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/31/11 14:50		267468	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/31/11 14:50		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:50		267468	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/31/11 14:50		267468	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/31/11 14:50		267468	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/31/11 14:50		267468	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/31/11 14:50		267468	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
n-Butanol	150	I	250	11	1	NA	10/31/11 14:50		267468	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/31/11 14:50		267468	
2-Hexanone	10	U	10	0.35	1	NA	10/31/11 14:50		267468	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/31/11 14:50		267468	
Acetone	20	U	20	0.98	1	NA	10/31/11 14:50		267468	
Benzene	5.0	U	5.0	0.21	1	NA	10/31/11 14:50		267468	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Bromoform	5.0	U	5.0	0.27	1	NA	10/31/11 14:50		267468	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:50		267468	
Carbon Disulfide	10	U	10	0.20	1	NA	10/31/11 14:50		267468	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/31/11 14:50		267468	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:50		267468	
Chloroform	5.0	U	5.0	0.22	1	NA	10/31/11 14:50		267468	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/31/11 14:50		267468	
Cyclohexane	10	U	10	0.24	1	NA	10/31/11 14:50		267468	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/31/11 14:50		267468	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/31/11 14:50		267468	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Methyl Acetate	10	U	10	0.23	1	NA	10/31/11 14:50		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Methylcyclohexane	10	U	10	0.25	1	NA	10/31/11 14:50		267468	
Styrene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Toluene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Trichloroethene (TCE)	1.1	I	5.0	0.23	1	NA	10/31/11 14:50		267468	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/31/11 14:50		267468	
cis-1,2-Dichloroethene	0.34	I	5.0	0.20	1	NA	10/31/11 14:50		267468	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/31/11 14:50		267468	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 14:50		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	10/31/11 14:50	
Dibromofluoromethane	101	89-119	10/31/11 14:50	
Toluene-d8	102	87-121	10/31/11 14:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/4/11 11:15		268312	
Ethene	1.0	U	1.0	1	NA	11/4/11 11:15		268312	
Methane	51		2.0	1	NA	11/4/11 11:15		268312	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11 1315
Date Received: 10/26/11
Date Analyzed: 11/8/11 20:43

Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\110711\X0006685.D\

Analysis Lot: 268467
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.7	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0067D-040.5-20111025
 Lab Code: R1106024-015

Service Request: R1106024
 Date Collected: 10/25/11 1202
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/28/11 22:26		267265	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/28/11 22:26		267265	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/28/11 22:26		267265	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/28/11 22:26		267265	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/28/11 22:26		267265	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/28/11 22:26		267265	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/28/11 22:26		267265	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
n-Butanol	250	U	250	11	1	NA	10/28/11 22:26		267265	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/28/11 22:26		267265	
2-Hexanone	10	U	10	0.35	1	NA	10/28/11 22:26		267265	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/28/11 22:26		267265	
Acetone	20	U	20	0.98	1	NA	10/28/11 22:26		267265	
Benzene	5.0	U	5.0	0.21	1	NA	10/28/11 22:26		267265	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Bromoform	5.0	U	5.0	0.27	1	NA	10/28/11 22:26		267265	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/28/11 22:26		267265	
Carbon Disulfide	10	U	10	0.20	1	NA	10/28/11 22:26		267265	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/28/11 22:26		267265	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/28/11 22:26		267265	
Chloroform	5.0	U	5.0	0.22	1	NA	10/28/11 22:26		267265	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/28/11 22:26		267265	
Cyclohexane	10	U	10	0.24	1	NA	10/28/11 22:26		267265	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/28/11 22:26		267265	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/28/11 22:26		267265	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Methyl Acetate	10	U	10	0.23	1	NA	10/28/11 22:26		267265	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0067D-040.5-20111025
Lab Code: R1106024-015

Service Request: R1106024
Date Collected: 10/25/11 1202
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Methylcyclohexane	10	U	10	0.25	1	NA	10/28/11 22:26		267265	
Styrene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Toluene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/28/11 22:26		267265	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
Vinyl Chloride	7.4		5.0	0.23	1	NA	10/28/11 22:26		267265	
cis-1,2-Dichloroethene	0.74	I	5.0	0.20	1	NA	10/28/11 22:26		267265	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/28/11 22:26		267265	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/28/11 22:26		267265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/28/11 22:26	
Dibromofluoromethane	103	89-119	10/28/11 22:26	
Toluene-d8	104	87-121	10/28/11 22:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0067D1-068.0-20111025
 Lab Code: R1106024-016

Service Request: R1106024
 Date Collected: 10/25/11 1336
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 03:23		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 03:23		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:23		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 03:23		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 03:23		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 03:23		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 03:23		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 03:23		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 03:23		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 03:23		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 03:23		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 03:23		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 03:23		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 03:23		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:23		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 03:23		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 03:23		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:23		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 03:23		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 03:23		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 03:23		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 03:23		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 03:23		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 03:23		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0067D1-068.0-20111025
Lab Code: R1106024-016

Service Request: R1106024
Date Collected: 10/25/11 1336
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 03:23		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 03:23		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 03:23		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 03:23		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 03:23		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	10/29/11 03:23	
Dibromofluoromethane	102	89-119	10/29/11 03:23	
Toluene-d8	103	87-121	10/29/11 03:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0070D-040.5-20111025
Lab Code: R1106024-017

Service Request: R1106024
Date Collected: 10/25/11 1100
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 03:53		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 03:53		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:53		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 03:53		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 03:53		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 03:53		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 03:53		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 03:53		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 03:53		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 03:53		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 03:53		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 03:53		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 03:53		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 03:53		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:53		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 03:53		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 03:53		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 03:53		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 03:53		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 03:53		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 03:53		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 03:53		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 03:53		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 03:53		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0070D-040.5-20111025
Lab Code: R1106024-017

Service Request: R1106024
Date Collected: 10/25/11 1100
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 03:53		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 03:53		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 03:53		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 03:53		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 03:53		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	10/29/11 03:53	
Dibromofluoromethane	102	89-119	10/29/11 03:53	
Toluene-d8	104	87-121	10/29/11 03:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0070D1-070.0-20111025
 Lab Code: R1106024-018

Service Request: R1106024
 Date Collected: 10/25/11 1124
 Date Received: 10/26/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 04:22		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 04:22		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:22		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 04:22		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 04:22		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 04:22		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 04:22		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 04:22		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 04:22		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 04:22		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 04:22		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 04:22		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 04:22		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 04:22		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:22		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 04:22		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 04:22		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:22		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 04:22		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 04:22		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 04:22		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 04:22		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 04:22		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 04:22		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0070D1-070.0-20111025
Lab Code: R1106024-018

Service Request: R1106024
Date Collected: 10/25/11 1124
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 04:22		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 04:22		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 04:22		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 04:22		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 04:22		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 04:22	
Dibromofluoromethane	101	89-119	10/29/11 04:22	
Toluene-d8	104	87-121	10/29/11 04:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0071D-040.5-20111025
Lab Code: R1106024-019

Service Request: R1106024
Date Collected: 10/25/11 1004
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 04:52		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 04:52		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:52		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 04:52		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 04:52		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 04:52		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 04:52		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 04:52		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 04:52		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 04:52		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 04:52		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 04:52		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 04:52		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 04:52		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:52		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 04:52		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 04:52		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 04:52		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 04:52		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 04:52		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 04:52		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 04:52		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 04:52		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 04:52		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0071D-040.5-20111025
Lab Code: R1106024-019

Service Request: R1106024
Date Collected: 10/25/11 1004
Date Received: 10/26/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 04:52		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 04:52		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 04:52		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 04:52		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 04:52		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/29/11 04:52	
Dibromofluoromethane	103	89-119	10/29/11 04:52	
Toluene-d8	105	87-121	10/29/11 04:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0071D1-070.0-20111025
Lab Code: R1106024-020

Service Request: R1106024
Date Collected: 10/25/11 1026
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 05:22		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 05:22		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:22		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 05:22		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 05:22		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 05:22		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 05:22		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 05:22		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 05:22		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 05:22		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 05:22		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 05:22		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 05:22		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 05:22		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:22		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 05:22		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 05:22		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:22		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 05:22		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 05:22		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 05:22		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 05:22		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 05:22		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 05:22		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0071D1-070.0-20111025
Lab Code: R1106024-020

Service Request: R1106024
Date Collected: 10/25/11 1026
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 05:22		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 05:22		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 05:22		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 05:22		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 05:22		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 05:22	
Dibromofluoromethane	102	89-119	10/29/11 05:22	
Toluene-d8	104	87-121	10/29/11 05:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-TB-20111025
 Lab Code: R1106024-024

Service Request: R1106024
 Date Collected: 10/25/11
 Date Received: 10/26/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 05:51		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 05:51		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:51		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 05:51		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 05:51		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 05:51		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 05:51		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 05:51		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 05:51		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 05:51		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 05:51		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 05:51		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 05:51		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 05:51		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:51		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 05:51		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 05:51		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 05:51		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 05:51		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 05:51		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 05:51		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 05:51		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 05:51		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 05:51		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-TB-20111025
Lab Code: R1106024-024

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 05:51		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 05:51		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 05:51		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 05:51		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 05:51		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 05:51	
Dibromofluoromethane	102	89-119	10/29/11 05:51	
Toluene-d8	105	87-121	10/29/11 05:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20111026
Lab Code: R1106024-025

Service Request: R1106024
Date Collected: 10/26/11 0950
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	11.8	mg/L	1.0	10	NA	11/4/11 18:19	
Carbon, Total Organic (TOC), Average	9060A	178	mg/L	20	20	NA	10/31/11 19:35	
Iodide	300.0	14.0	mg/L	2.0	10	NA	10/27/11 13:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002A-024.5-20111026
 Lab Code: R1106024-025

Service Request: R1106024
 Date Collected: 10/26/11 0950
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	10/30/11 16:06		267361	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,1,2-Trichloroethane	500	U	500	23	100	NA	10/30/11 16:06		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	1100		500	31	100	NA	10/30/11 16:06		267361	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	10/30/11 16:06		267361	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	10/30/11 16:06		267361	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	10/30/11 16:06		267361	
1,2-Dibromoethane	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,2-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,2-Dichloroethane	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,2-Dichloropropane	500	U	500	29	100	NA	10/30/11 16:06		267361	
1,3-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 16:06		267361	
1,4-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 16:06		267361	
n-Butanol	25000	U	25000	1100	100	NA	10/30/11 16:06		267361	
2-Butanone (MEK)	1000	U	1000	51	100	NA	10/30/11 16:06		267361	
2-Hexanone	1000	U	1000	35	100	NA	10/30/11 16:06		267361	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	10/30/11 16:06		267361	
Acetone	2000	U	2000	98	100	NA	10/30/11 16:06		267361	
Benzene	500	U	500	21	100	NA	10/30/11 16:06		267361	
Bromodichloromethane	500	U	500	20	100	NA	10/30/11 16:06		267361	
Bromoform	500	U	500	27	100	NA	10/30/11 16:06		267361	
Bromomethane	500	U	500	31	100	NA	10/30/11 16:06		267361	
Carbon Disulfide	1000	U	1000	20	100	NA	10/30/11 16:06		267361	
Carbon Tetrachloride	500	U	500	27	100	NA	10/30/11 16:06		267361	
Chlorobenzene	500	U	500	20	100	NA	10/30/11 16:06		267361	
Chloroethane	500	U	500	31	100	NA	10/30/11 16:06		267361	
Chloroform	500	U	500	22	100	NA	10/30/11 16:06		267361	
Chloromethane	500	U	500	24	100	NA	10/30/11 16:06		267361	
Cyclohexane	1000	U	1000	24	100	NA	10/30/11 16:06		267361	
Dibromochloromethane	500	U	500	20	100	NA	10/30/11 16:06		267361	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	10/30/11 16:06		267361	
Dichloromethane	500	U	500	22	100	NA	10/30/11 16:06		267361	
Ethylbenzene	500	U	500	20	100	NA	10/30/11 16:06		267361	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	10/30/11 16:06		267361	
Methyl Acetate	1000	U	1000	23	100	NA	10/30/11 16:06		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20111026
Lab Code: R1106024-025

Service Request: R1106024
Date Collected: 10/26/11 0950
Date Received: 10/27/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	10/30/11 16:06		267361	
Methylcyclohexane	1000	U	1000	25	100	NA	10/30/11 16:06		267361	
Styrene	500	U	500	20	100	NA	10/30/11 16:06		267361	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	10/30/11 16:06		267361	
Toluene	500	U	500	20	100	NA	10/30/11 16:06		267361	
Trichloroethene (TCE)	31	I	500	23	100	NA	10/30/11 16:06		267361	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	10/30/11 16:06		267361	
Vinyl Chloride	850		500	23	100	NA	10/30/11 16:06		267361	
cis-1,2-Dichloroethene	13000		500	20	100	NA	10/30/11 16:06		267361	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 16:06		267361	
m,p-Xylenes	500	U	500	20	100	NA	10/30/11 16:06		267361	
n-Butyl Acetate	500	U	500	21	100	NA	10/30/11 16:06		267361	
o-Xylene	500	U	500	20	100	NA	10/30/11 16:06		267361	
trans-1,2-Dichloroethene	330	I	500	20	100	NA	10/30/11 16:06		267361	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 16:06		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	10/30/11 16:06	
Dibromofluoromethane	103	89-119	10/30/11 16:06	
Toluene-d8	105	87-121	10/30/11 16:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20111026
Lab Code: R1106024-025

Service Request: R1106024
Date Collected: 10/26/11 0950
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	3.0		1.0	1	NA	11/7/11 11:04		268430	
Ethene	46		1.0	1	NA	11/7/11 11:04		268430	
Methane	660		20	10	NA	11/7/11 11:27		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 0950
Date Received: 10/27/11
Date Analyzed: 11/11/11 17:43

Sample Name: LC34-BW0002A-024.5-20111026
Lab Code: R1106024-025

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111111\X0006749.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	370	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	57	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	2.0 U	2.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20111026
Lab Code: R1106024-026

Service Request: R1106024
Date Collected: 10/26/11 0910
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	6.8		mg/L	1.0	10	NA	11/4/11 18:34	
Carbon, Total Organic (TOC), Average	9060A	107		mg/L	10	10	NA	10/31/11 20:15	
Iodide	300.0	7.4		mg/L	2.0	10	NA	10/27/11 13:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002B-031.5-20111026
 Lab Code: R1106024-026

Service Request: R1106024
 Date Collected: 10/26/11 0910
 Date Received: 10/27/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	10/29/11 06:51		267270	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	10/29/11 06:51		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5400		1300	78	250	NA	10/29/11 06:51		267270	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	10/29/11 06:51		267270	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	10/29/11 06:51		267270	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	10/29/11 06:51		267270	
1,2-Dibromoethane	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,2-Dichloroethane	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,2-Dichloropropane	1300	U	1300	70	250	NA	10/29/11 06:51		267270	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
n-Butanol	63000	U	63000	2700	250	NA	10/29/11 06:51		267270	
2-Butanone (MEK)	2500	U	2500	130	250	NA	10/29/11 06:51		267270	
2-Hexanone	2500	U	2500	88	250	NA	10/29/11 06:51		267270	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	10/29/11 06:51		267270	
Acetone	5000	U	5000	250	250	NA	10/29/11 06:51		267270	
Benzene	1300	U	1300	53	250	NA	10/29/11 06:51		267270	
Bromodichloromethane	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Bromoform	1300	U	1300	68	250	NA	10/29/11 06:51		267270	
Bromomethane	1300	U	1300	78	250	NA	10/29/11 06:51		267270	
Carbon Disulfide	2500	U	2500	50	250	NA	10/29/11 06:51		267270	
Carbon Tetrachloride	1300	U	1300	68	250	NA	10/29/11 06:51		267270	
Chlorobenzene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Chloroethane	1300	U	1300	78	250	NA	10/29/11 06:51		267270	
Chloroform	1300	U	1300	55	250	NA	10/29/11 06:51		267270	
Chloromethane	1300	U	1300	60	250	NA	10/29/11 06:51		267270	
Cyclohexane	2500	U	2500	60	250	NA	10/29/11 06:51		267270	
Dibromochloromethane	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	10/29/11 06:51		267270	
Dichloromethane	1300	U	1300	55	250	NA	10/29/11 06:51		267270	
Ethylbenzene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Methyl Acetate	2500	U	2500	58	250	NA	10/29/11 06:51		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20111026
Lab Code: R1106024-026

Service Request: R1106024
Date Collected: 10/26/11 0910
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Methylcyclohexane	2500	U	2500	63	250	NA	10/29/11 06:51		267270	
Styrene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Toluene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Trichloroethene (TCE)	320	I	1300	58	250	NA	10/29/11 06:51		267270	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
Vinyl Chloride	1300		1300	58	250	NA	10/29/11 06:51		267270	
cis-1,2-Dichloroethene	36000		1300	50	250	NA	10/29/11 06:51		267270	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
m,p-Xylenes	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
n-Butyl Acetate	1300	U	1300	53	250	NA	10/29/11 06:51		267270	
o-Xylene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	
trans-1,2-Dichloroethene	720	I	1300	50	250	NA	10/29/11 06:51		267270	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 06:51		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 06:51	
Dibromofluoromethane	103	89-119	10/29/11 06:51	
Toluene-d8	105	87-121	10/29/11 06:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20111026
Lab Code: R1106024-026

Service Request: R1106024
Date Collected: 10/26/11 0910
Date Received: 10/27/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	15		1.0	1	NA	11/7/11 11:40		268430	
Ethene	27		1.0	1	NA	11/7/11 11:40		268430	
Methane	82		2.0	1	NA	11/7/11 11:40		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 0910
Date Received: 10/27/11
Date Analyzed: 11/11/11 19:36

Sample Name: LC34-BW0002B-031.5-20111026
Lab Code: RI106024-026

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111111\X0006751.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	230	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	30	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	2.4	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Service Request: R1106024
Date Collected: 10/26/11 1025
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	366		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	2.9		mg/L	1.0	10	NA	10/27/11 20:52	
Carbon, Total Organic (TOC), Average	9060A	78		mg/L	10	10	NA	10/31/11 20:55	
Chloride	300.0	548		mg/L	20	100	NA	10/28/11 13:45	
Iodide	300.0	6.6		mg/L	2.0	10	NA	10/27/11 13:28	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/27/11 20:52	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	10/28/11 13:45	*
Sulfate	300.0	4.2		mg/L	2.0	10	NA	10/27/11 20:52	
Sulfide, Total	SM 4500-S2- F	10.9		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002C-038.5-20111026
 Lab Code: R1106024-027

Service Request: R1106024
 Date Collected: 10/26/11 1025
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	10/29/11 07:21		267270	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	10/29/11 07:21		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	400	I	1300	78	250	NA	10/29/11 07:21		267270	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	10/29/11 07:21		267270	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	10/29/11 07:21		267270	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	10/29/11 07:21		267270	
1,2-Dibromoethane	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,2-Dichloroethane	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,2-Dichloropropane	1300	U	1300	70	250	NA	10/29/11 07:21		267270	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
n-Butanol	63000	U	63000	2700	250	NA	10/29/11 07:21		267270	
2-Butanone (MEK)	2500	U	2500	130	250	NA	10/29/11 07:21		267270	
2-Hexanone	2500	U	2500	88	250	NA	10/29/11 07:21		267270	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	10/29/11 07:21		267270	
Acetone	5000	U	5000	250	250	NA	10/29/11 07:21		267270	
Benzene	1300	U	1300	53	250	NA	10/29/11 07:21		267270	
Bromodichloromethane	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Bromoform	1300	U	1300	68	250	NA	10/29/11 07:21		267270	
Bromomethane	1300	U	1300	78	250	NA	10/29/11 07:21		267270	
Carbon Disulfide	2500	U	2500	50	250	NA	10/29/11 07:21		267270	
Carbon Tetrachloride	1300	U	1300	68	250	NA	10/29/11 07:21		267270	
Chlorobenzene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Chloroethane	1300	U	1300	78	250	NA	10/29/11 07:21		267270	
Chloroform	1300	U	1300	55	250	NA	10/29/11 07:21		267270	
Chloromethane	1300	U	1300	60	250	NA	10/29/11 07:21		267270	
Cyclohexane	2500	U	2500	60	250	NA	10/29/11 07:21		267270	
Dibromochloromethane	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	10/29/11 07:21		267270	
Dichloromethane	1300	U	1300	55	250	NA	10/29/11 07:21		267270	
Ethylbenzene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Methyl Acetate	2500	U	2500	58	250	NA	10/29/11 07:21		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Service Request: R1106024
Date Collected: 10/26/11 1025
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Methylcyclohexane	2500	U	2500	63	250	NA	10/29/11 07:21		267270	
Styrene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Toluene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Trichloroethene (TCE)	530	I	1300	58	250	NA	10/29/11 07:21		267270	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
Vinyl Chloride	3800		1300	58	250	NA	10/29/11 07:21		267270	
cis-1,2-Dichloroethene	66000		2500	100	500	NA	10/30/11 16:35		267361	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
m,p-Xylenes	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
n-Butyl Acetate	1300	U	1300	53	250	NA	10/29/11 07:21		267270	
o-Xylene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	
trans-1,2-Dichloroethene	320	I	1300	50	250	NA	10/29/11 07:21		267270	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 07:21		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 07:21	
Dibromofluoromethane	102	89-119	10/29/11 07:21	
Toluene-d8	104	87-121	10/29/11 07:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Service Request: R1106024
Date Collected: 10/26/11 1025
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	110		2.0	2	NA	11/7/11 12:06		268430	
Ethene	31		1.0	1	NA	11/7/11 11:51		268430	
Methane	170		4.0	2	NA	11/7/11 12:06		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1025
Date Received: 10/27/11
Date Analyzed: 11/11/11 03:49

Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006738.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	160	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	43	2.0	
50-21-5	Lactic Acid	1.1	1.0	
79-09-4	Propionic Acid	2.0	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20111026
Lab Code: R1106024-028

Service Request: R1106024
Date Collected: 10/26/11 1110
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	11.7	mg/L	1.0	10	NA	11/4/11 18:48	
Carbon, Total Organic (TOC), Average	9060A	102	mg/L	10	10	NA	10/31/11 22:55	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 13:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002D-045.5-20111026
 Lab Code: R1106024-028

Service Request: R1106024
 Date Collected: 10/26/11 1110
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	10/29/11 07:50		267270	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,1,2-Trichloroethane	250	U	250	12	50	NA	10/29/11 07:50		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	50	NA	10/29/11 07:50		267270	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,1-Dichloroethene (1,1-DCE)	250	U	250	15	50	NA	10/29/11 07:50		267270	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	10/29/11 07:50		267270	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	10/29/11 07:50		267270	
1,2-Dibromoethane	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,2-Dichlorobenzene	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,2-Dichloroethane	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,2-Dichloropropane	250	U	250	15	50	NA	10/29/11 07:50		267270	
1,3-Dichlorobenzene	250	U	250	10	50	NA	10/29/11 07:50		267270	
1,4-Dichlorobenzene	250	U	250	10	50	NA	10/29/11 07:50		267270	
n-Butanol	13000	U	13000	530	50	NA	10/29/11 07:50		267270	
2-Butanone (MEK)	500	U	500	26	50	NA	10/29/11 07:50		267270	
2-Hexanone	500	U	500	18	50	NA	10/29/11 07:50		267270	
4-Methyl-2-pentanone	500	U	500	14	50	NA	10/29/11 07:50		267270	
Acetone	1000	U	1000	49	50	NA	10/29/11 07:50		267270	
Benzene	250	U	250	11	50	NA	10/29/11 07:50		267270	
Bromodichloromethane	250	U	250	10	50	NA	10/29/11 07:50		267270	
Bromoform	250	U	250	14	50	NA	10/29/11 07:50		267270	
Bromomethane	250	U	250	16	50	NA	10/29/11 07:50		267270	
Carbon Disulfide	500	U	500	10	50	NA	10/29/11 07:50		267270	
Carbon Tetrachloride	250	U	250	14	50	NA	10/29/11 07:50		267270	
Chlorobenzene	250	U	250	10	50	NA	10/29/11 07:50		267270	
Chloroethane	250	U	250	16	50	NA	10/29/11 07:50		267270	
Chloroform	250	U	250	11	50	NA	10/29/11 07:50		267270	
Chloromethane	250	U	250	12	50	NA	10/29/11 07:50		267270	
Cyclohexane	500	U	500	12	50	NA	10/29/11 07:50		267270	
Dibromochloromethane	250	U	250	10	50	NA	10/29/11 07:50		267270	
Dichlorodifluoromethane (CFC 12)	250	U	250	29	50	NA	10/29/11 07:50		267270	
Dichloromethane	250	U	250	11	50	NA	10/29/11 07:50		267270	
Ethylbenzene	250	U	250	10	50	NA	10/29/11 07:50		267270	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	10/29/11 07:50		267270	
Methyl Acetate	500	U	500	12	50	NA	10/29/11 07:50		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20111026
Lab Code: R1106024-028

Service Request: R1106024
Date Collected: 10/26/11 1110
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	250	U	250	10	50	NA	10/29/11 07:50		267270	
Methylcyclohexane	500	U	500	13	50	NA	10/29/11 07:50		267270	
Styrene	250	U	250	10	50	NA	10/29/11 07:50		267270	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	10/29/11 07:50		267270	
Toluene	250	U	250	10	50	NA	10/29/11 07:50		267270	
Trichloroethene (TCE)	29	I	250	12	50	NA	10/29/11 07:50		267270	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	10/29/11 07:50		267270	
Vinyl Chloride	3900		250	12	50	NA	10/29/11 07:50		267270	
cis-1,2-Dichloroethene	16000		500	20	100	NA	10/30/11 17:05		267361	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	10/29/11 07:50		267270	
m,p-Xylenes	250	U	250	10	50	NA	10/29/11 07:50		267270	
n-Butyl Acetate	250	U	250	11	50	NA	10/29/11 07:50		267270	
o-Xylene	250	U	250	10	50	NA	10/29/11 07:50		267270	
trans-1,2-Dichloroethene	110	I	250	10	50	NA	10/29/11 07:50		267270	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	10/29/11 07:50		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/29/11 07:50	
Dibromofluoromethane	103	89-119	10/29/11 07:50	
Toluene-d8	105	87-121	10/29/11 07:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20111026
Lab Code: R1106024-028

Service Request: R1106024
Date Collected: 10/26/11 1110
Date Received: 10/27/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	27		1.0	1	NA	11/7/11 12:21		268430	
Ethene	21		1.0	1	NA	11/7/11 12:21		268430	
Methane	65		2.0	1	NA	11/7/11 12:21		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1110
Date Received: 10/27/11
Date Analyzed: 11/11/11 05:42

Sample Name: LC34-BW0002D-045.5-20111026
Lab Code: R1106024-028

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006740.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	130	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	61	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	13	1.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.0-20111026
Lab Code: R1106024-029

Service Request: R1106024
Date Collected: 10/26/11 1230
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.2		mg/L	1.0	10	NA	11/4/11 23:42	
Carbon, Total Organic (TOC), Average	9060A	4.0		mg/L	1.0	1	NA	10/31/11 23:34	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	10/27/11 13:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002E-052.0-20111026
 Lab Code: R1106024-029

Service Request: R1106024
 Date Collected: 10/26/11 1230
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/30/11 17:35		267361	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/30/11 17:35		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.40	I	5.0	0.31	1	NA	10/30/11 17:35		267361	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/30/11 17:35		267361	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/30/11 17:35		267361	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/30/11 17:35		267361	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/30/11 17:35		267361	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
n-Butanol	250	U	250	11	1	NA	10/30/11 17:35		267361	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/30/11 17:35		267361	
2-Hexanone	10	U	10	0.35	1	NA	10/30/11 17:35		267361	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/30/11 17:35		267361	
Acetone	20	U	20	0.98	1	NA	10/30/11 17:35		267361	
Benzene	5.0	U	5.0	0.21	1	NA	10/30/11 17:35		267361	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Bromoform	5.0	U	5.0	0.27	1	NA	10/30/11 17:35		267361	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/30/11 17:35		267361	
Carbon Disulfide	0.48	I	10	0.20	1	NA	10/30/11 17:35		267361	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/30/11 17:35		267361	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/30/11 17:35		267361	
Chloroform	5.0	U	5.0	0.22	1	NA	10/30/11 17:35		267361	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/30/11 17:35		267361	
Cyclohexane	10	U	10	0.24	1	NA	10/30/11 17:35		267361	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/30/11 17:35		267361	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/30/11 17:35		267361	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Methyl Acetate	10	U	10	0.23	1	NA	10/30/11 17:35		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.0-20111026
Lab Code: R1106024-029

Service Request: R1106024
Date Collected: 10/26/11 1230
Date Received: 10/27/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Methylcyclohexane	10	U	10	0.25	1	NA	10/30/11 17:35		267361	
Styrene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Toluene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Trichloroethene (TCE)	0.35	I	5.0	0.23	1	NA	10/30/11 17:35		267361	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
Vinyl Chloride	69		5.0	0.23	1	NA	10/30/11 17:35		267361	
cis-1,2-Dichloroethene	15		5.0	0.20	1	NA	10/30/11 17:35		267361	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/30/11 17:35		267361	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	
trans-1,2-Dichloroethene	0.64	I	5.0	0.20	1	NA	10/30/11 17:35		267361	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 17:35		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	10/30/11 17:35	
Dibromofluoromethane	103	89-119	10/30/11 17:35	
Toluene-d8	105	87-121	10/30/11 17:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.0-20111026
Lab Code: R1106024-029

Service Request: R1106024
Date Collected: 10/26/11 1230
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/7/11 12:33		268430	
Ethene	3.3		1.0	1	NA	11/7/11 12:33		268430	
Methane	17		2.0	1	NA	11/7/11 12:33		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1230
Date Received: 10/27/11
Date Analyzed: 11/10/11 11:47

Sample Name: LC34-BW0002E-052.0-20111026
Lab Code: R1106024-029

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\110911\X0006721.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.8	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20111026
Lab Code: R1106024-030

Service Request: R1106024
Date Collected: 10/26/11 1300
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.3	mg/L	1.0	10	NA	11/4/11 23:57	
Carbon, Total Organic (TOC), Average	9060A	3.5	mg/L	1.0	1	NA	10/31/11 00:14	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 13:51	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0002F-059.5-20111026
 Lab Code: R1106024-030

Service Request: R1106024
 Date Collected: 10/26/11 1300
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/30/11 18:05		267361	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/30/11 18:05		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/30/11 18:05		267361	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/30/11 18:05		267361	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/30/11 18:05		267361	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/30/11 18:05		267361	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/30/11 18:05		267361	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
n-Butanol	250	U	250	11	1	NA	10/30/11 18:05		267361	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/30/11 18:05		267361	
2-Hexanone	10	U	10	0.35	1	NA	10/30/11 18:05		267361	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/30/11 18:05		267361	
Acetone	20	U	20	0.98	1	NA	10/30/11 18:05		267361	
Benzene	5.0	U	5.0	0.21	1	NA	10/30/11 18:05		267361	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Bromoform	5.0	U	5.0	0.27	1	NA	10/30/11 18:05		267361	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/30/11 18:05		267361	
Carbon Disulfide	10	U	10	0.20	1	NA	10/30/11 18:05		267361	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/30/11 18:05		267361	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/30/11 18:05		267361	
Chloroform	5.0	U	5.0	0.22	1	NA	10/30/11 18:05		267361	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/30/11 18:05		267361	
Cyclohexane	10	U	10	0.24	1	NA	10/30/11 18:05		267361	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/30/11 18:05		267361	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/30/11 18:05		267361	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Methyl Acetate	10	U	10	0.23	1	NA	10/30/11 18:05		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20111026
Lab Code: R1106024-030

Service Request: R1106024
Date Collected: 10/26/11 1300
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Methylcyclohexane	10	U	10	0.25	1	NA	10/30/11 18:05		267361	
Styrene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Toluene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Trichloroethene (TCE)	0.50	I	5.0	0.23	1	NA	10/30/11 18:05		267361	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
Vinyl Chloride	35		5.0	0.23	1	NA	10/30/11 18:05		267361	
cis-1,2-Dichloroethene	8.2		5.0	0.20	1	NA	10/30/11 18:05		267361	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/30/11 18:05		267361	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	
trans-1,2-Dichloroethene	0.63	I	5.0	0.20	1	NA	10/30/11 18:05		267361	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 18:05		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	10/30/11 18:05	
Dibromofluoromethane	103	89-119	10/30/11 18:05	
Toluene-d8	105	87-121	10/30/11 18:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20111026
Lab Code: R1106024-030

Service Request: R1106024
Date Collected: 10/26/11 1300
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	1.0	U	1.0	1	NA	11/7/11 13:06		268430	
Ethene	7.2		1.0	1	NA	11/7/11 13:06		268430	
Methane	8.6		2.0	1	NA	11/7/11 13:06		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1300
Date Received: 10/27/11
Date Analyzed: 11/10/11 13:40

Sample Name: LC34-BW0002F-059.5-20111026
Lab Code: R1106024-030

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\110911\X0006723.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20111026
Lab Code: R1106024-031

Service Request: R1106024
Date Collected: 10/26/11 1332
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0 U	mg/L	1.0	10	NA	11/4/11 19:58	
Carbon, Total Organic (TOC), Average	9060A	5.7	mg/L	1.0	1	NA	11/1/11 01:34	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 14:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20111026
Lab Code: R1106024-031

Service Request: R1106024
Date Collected: 10/26/11 1332
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	10/29/11 09:19		267270	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	10/29/11 09:19		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	150	I	1300	78	250	NA	10/29/11 09:19		267270	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	10/29/11 09:19		267270	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	10/29/11 09:19		267270	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	10/29/11 09:19		267270	
1,2-Dibromoethane	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,2-Dichloroethane	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,2-Dichloropropane	1300	U	1300	70	250	NA	10/29/11 09:19		267270	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
n-Butanol	63000	U	63000	2700	250	NA	10/29/11 09:19		267270	
2-Butanone (MEK)	2500	U	2500	130	250	NA	10/29/11 09:19		267270	
2-Hexanone	2500	U	2500	88	250	NA	10/29/11 09:19		267270	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	10/29/11 09:19		267270	
Acetone	5000	U	5000	250	250	NA	10/29/11 09:19		267270	
Benzene	1300	U	1300	53	250	NA	10/29/11 09:19		267270	
Bromodichloromethane	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Bromoform	1300	U	1300	68	250	NA	10/29/11 09:19		267270	
Bromomethane	1300	U	1300	78	250	NA	10/29/11 09:19		267270	
Carbon Disulfide	2500	U	2500	50	250	NA	10/29/11 09:19		267270	
Carbon Tetrachloride	1300	U	1300	68	250	NA	10/29/11 09:19		267270	
Chlorobenzene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Chloroethane	1300	U	1300	78	250	NA	10/29/11 09:19		267270	
Chloroform	1300	U	1300	55	250	NA	10/29/11 09:19		267270	
Chloromethane	1300	U	1300	60	250	NA	10/29/11 09:19		267270	
Cyclohexane	2500	U	2500	60	250	NA	10/29/11 09:19		267270	
Dibromochloromethane	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	10/29/11 09:19		267270	
Dichloromethane	1300	U	1300	55	250	NA	10/29/11 09:19		267270	
Ethylbenzene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Methyl Acetate	2500	U	2500	58	250	NA	10/29/11 09:19		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20111026
Lab Code: R1106024-031

Service Request: R1106024
Date Collected: 10/26/11 1332
Date Received: 10/27/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Methylcyclohexane	2500	U	2500	63	250	NA	10/29/11 09:19		267270	
Styrene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Toluene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Trichloroethene (TCE)	1300	U	1300	58	250	NA	10/29/11 09:19		267270	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
Vinyl Chloride	2100		1300	58	250	NA	10/29/11 09:19		267270	
cis-1,2-Dichloroethene	30000		1300	50	250	NA	10/29/11 09:19		267270	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
m,p-Xylenes	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
n-Butyl Acetate	1300	U	1300	53	250	NA	10/29/11 09:19		267270	
o-Xylene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	
trans-1,2-Dichloroethene	790	I	1300	50	250	NA	10/29/11 09:19		267270	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	10/29/11 09:19		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/29/11 09:19	
Dibromofluoromethane	103	89-119	10/29/11 09:19	
Toluene-d8	105	87-121	10/29/11 09:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20111026
Lab Code: R1106024-031

Service Request: R1106024
Date Collected: 10/26/11 1332
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.9		1.0	1	NA	11/7/11 13:44		268430	
Ethene	53		1.0	1	NA	11/7/11 13:44		268430	
Methane	94		2.0	1	NA	11/7/11 13:44		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1332
Date Received: 10/27/11
Date Analyzed: 11/10/11 15:33

Sample Name: LC34-BW0003A-024.5-20111026
Lab Code: R1106024-031

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110911\X0006725.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	9.0		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20111026
Lab Code: R1106024-032

Service Request: R1106024
Date Collected: 10/26/11 1409
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	10.8	mg/L	1.0	10	NA	11/4/11 20:12	
Carbon, Total Organic (TOC), Average	9060A	169	mg/L	20	20	NA	11/1/11 02:53	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 14:29	



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20111026
Lab Code: R1106024-032

Service Request: R1106024
Date Collected: 10/26/11 1409
Date Received: 10/27/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130	U	130	5.8	25	NA	10/30/11 18:34		267361	
1,1,2,2-Tetrachloroethane	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,1,2-Trichloroethane	130	U	130	5.8	25	NA	10/30/11 18:34		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	410		130	7.8	25	NA	10/30/11 18:34		267361	
1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	25	NA	10/30/11 18:34		267361	
1,2,4-Trichlorobenzene	130	U	130	6.5	25	NA	10/30/11 18:34		267361	
1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	25	NA	10/30/11 18:34		267361	
1,2-Dibromoethane	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,2-Dichlorobenzene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,2-Dichloroethane	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,2-Dichloropropane	130	U	130	7.1	25	NA	10/30/11 18:34		267361	
1,3-Dichlorobenzene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
1,4-Dichlorobenzene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
n-Butanol	6300	U	6300	270	25	NA	10/30/11 18:34		267361	
2-Butanone (MEK)	250	U	250	13	25	NA	10/30/11 18:34		267361	
2-Hexanone	250	U	250	8.8	25	NA	10/30/11 18:34		267361	
4-Methyl-2-pentanone	250	U	250	6.8	25	NA	10/30/11 18:34		267361	
Acetone	500	U	500	25	25	NA	10/30/11 18:34		267361	
Benzene	130	U	130	5.3	25	NA	10/30/11 18:34		267361	
Bromodichloromethane	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Bromoform	130	U	130	6.8	25	NA	10/30/11 18:34		267361	
Bromomethane	130	U	130	7.8	25	NA	10/30/11 18:34		267361	
Carbon Disulfide	250	U	250	5.0	25	NA	10/30/11 18:34		267361	
Carbon Tetrachloride	130	U	130	6.8	25	NA	10/30/11 18:34		267361	
Chlorobenzene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Chloroethane	130	U	130	7.8	25	NA	10/30/11 18:34		267361	
Chloroform	130	U	130	5.5	25	NA	10/30/11 18:34		267361	
Chloromethane	130	U	130	6.0	25	NA	10/30/11 18:34		267361	
Cyclohexane	250	U	250	6.0	25	NA	10/30/11 18:34		267361	
Dibromochloromethane	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Dichlorodifluoromethane (CFC 12)	130	U	130	15	25	NA	10/30/11 18:34		267361	
Dichloromethane	130	U	130	5.5	25	NA	10/30/11 18:34		267361	
Ethylbenzene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Isopropylbenzene (Cumene)	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Methyl Acetate	250	U	250	5.8	25	NA	10/30/11 18:34		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20111026
Lab Code: R1106024-032

Service Request: R1106024
Date Collected: 10/26/11 1409
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Methylcyclohexane	250	U	250	6.3	25	NA	10/30/11 18:34		267361	
Styrene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Tetrachloroethene (PCE)	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Toluene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Trichloroethene (TCE)	96	I	130	5.8	25	NA	10/30/11 18:34		267361	
Trichlorofluoromethane (CFC 11)	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
Vinyl Chloride	1900		130	5.8	25	NA	10/30/11 18:34		267361	
cis-1,2-Dichloroethene	3500		130	5.0	25	NA	10/30/11 18:34		267361	
cis-1,3-Dichloropropene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
m,p-Xylenes	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
n-Butyl Acetate	6.5	I	130	5.3	25	NA	10/30/11 18:34		267361	
o-Xylene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	
trans-1,2-Dichloroethene	27	I	130	5.0	25	NA	10/30/11 18:34		267361	
trans-1,3-Dichloropropene	130	U	130	5.0	25	NA	10/30/11 18:34		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	10/30/11 18:34	
Dibromofluoromethane	102	89-119	10/30/11 18:34	
Toluene-d8	105	87-121	10/30/11 18:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20111026
Lab Code: R1106024-032

Service Request: R1106024
Date Collected: 10/26/11 1409
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	11		1.0	1	NA	11/7/11 14:28		268433	
Ethene	35		1.0	1	NA	11/7/11 14:28		268433	
Methane	1800		50	25	NA	11/7/11 15:57		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1409
Date Received: 10/27/11
Date Analyzed: 11/11/11 21:29

Sample Name: LC34-BW0003D-045.5-20111026
Lab Code: R1106024-032

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111111\X0006753.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	250	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	99	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	24	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-TB-20111026
Lab Code: R1106024-033

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 10:19		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 10:19		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 10:19		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 10:19		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 10:19		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 10:19		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 10:19		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
n-Butanol	250	U	250	11	1	NA	10/29/11 10:19		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 10:19		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 10:19		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 10:19		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 10:19		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 10:19		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 10:19		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 10:19		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 10:19		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 10:19		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 10:19		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 10:19		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 10:19		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 10:19		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 10:19		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 10:19		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 10:19		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-TB-20111026
Lab Code: R1106024-033

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 10:19		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Toluene	0.21	I	5.0	0.20	1	NA	10/29/11 10:19		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 10:19		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 10:19		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 10:19		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 10:19		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/29/11 10:19	
Dibromofluoromethane	101	89-119	10/29/11 10:19	
Toluene-d8	105	87-121	10/29/11 10:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111026
Lab Code: R1106024-034

Service Request: R1106024
Date Collected: 10/26/11 0923
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	468		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	13.6		mg/L	1.0	10	NA	10/27/11 21:06	
Carbon, Total Organic (TOC), Average	9060A	246		mg/L	20	20	NA	11/1/11 03:33	
Chloride	300.0	437		mg/L	20	100	NA	10/28/11 13:59	
Iodide	300.0	14.0		mg/L	2.0	10	NA	10/27/11 14:37	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/27/11 21:06	
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	10/28/11 13:59	*
Sulfate	300.0	2.1		mg/L	2.0	10	NA	10/27/11 21:06	
Sulfide, Total	SM 4500-S2- F	17.1		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111026 Dissolved
Lab Code: R1106024-035

Service Request: R1106024
Date Collected: 10/26/11 0923
Date Received: 10/27/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 11:09	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/4/11 11:09	
Manganese, Dissolved	6010C	20		µg/L	10	1	10/31/11	11/4/11 11:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20111026
 Lab Code: R1106024-034

Service Request: R1106024
 Date Collected: 10/26/11 0923
 Date Received: 10/27/11
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	10/30/11 19:04		267361	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,1,2-Trichloroethane	500	U	500	23	100	NA	10/30/11 19:04		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		500	31	100	NA	10/30/11 19:04		267361	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	10/30/11 19:04		267361	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	10/30/11 19:04		267361	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	10/30/11 19:04		267361	
1,2-Dibromoethane	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,2-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,2-Dichloroethane	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,2-Dichloropropane	500	U	500	29	100	NA	10/30/11 19:04		267361	
1,3-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:04		267361	
1,4-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:04		267361	
n-Butanol	1800	I	25000	1100	100	NA	10/30/11 19:04		267361	
2-Butanone (MEK)	1000	U	1000	51	100	NA	10/30/11 19:04		267361	
2-Hexanone	1000	U	1000	35	100	NA	10/30/11 19:04		267361	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	10/30/11 19:04		267361	
Acetone	2000	U	2000	98	100	NA	10/30/11 19:04		267361	
Benzene	500	U	500	21	100	NA	10/30/11 19:04		267361	
Bromodichloromethane	500	U	500	20	100	NA	10/30/11 19:04		267361	
Bromoform	500	U	500	27	100	NA	10/30/11 19:04		267361	
Bromomethane	500	U	500	31	100	NA	10/30/11 19:04		267361	
Carbon Disulfide	1000	U	1000	20	100	NA	10/30/11 19:04		267361	
Carbon Tetrachloride	500	U	500	27	100	NA	10/30/11 19:04		267361	
Chlorobenzene	500	U	500	20	100	NA	10/30/11 19:04		267361	
Chloroethane	500	U	500	31	100	NA	10/30/11 19:04		267361	
Chloroform	500	U	500	22	100	NA	10/30/11 19:04		267361	
Chloromethane	500	U	500	24	100	NA	10/30/11 19:04		267361	
Cyclohexane	1000	U	1000	24	100	NA	10/30/11 19:04		267361	
Dibromochloromethane	500	U	500	20	100	NA	10/30/11 19:04		267361	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	10/30/11 19:04		267361	
Dichloromethane	500	U	500	22	100	NA	10/30/11 19:04		267361	
Ethylbenzene	500	U	500	20	100	NA	10/30/11 19:04		267361	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	10/30/11 19:04		267361	
Methyl Acetate	1000	U	1000	23	100	NA	10/30/11 19:04		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111026
Lab Code: R1106024-034

Service Request: R1106024
Date Collected: 10/26/11 0923
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	500	U	500	20	100	NA	10/30/11 19:04		267361	
Methylcyclohexane	1000	U	1000	25	100	NA	10/30/11 19:04		267361	
Styrene	500	U	500	20	100	NA	10/30/11 19:04		267361	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	10/30/11 19:04		267361	
Toluene	500	U	500	20	100	NA	10/30/11 19:04		267361	
Trichloroethene (TCE)	3900		500	23	100	NA	10/30/11 19:04		267361	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	10/30/11 19:04		267361	
Vinyl Chloride	4800		500	23	100	NA	10/30/11 19:04		267361	
cis-1,2-Dichloroethene	16000		500	20	100	NA	10/30/11 19:04		267361	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 19:04		267361	
m,p-Xylenes	500	U	500	20	100	NA	10/30/11 19:04		267361	
n-Butyl Acetate	500	U	500	21	100	NA	10/30/11 19:04		267361	
o-Xylene	500	U	500	20	100	NA	10/30/11 19:04		267361	
trans-1,2-Dichloroethene	170	I	500	20	100	NA	10/30/11 19:04		267361	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 19:04		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	10/30/11 19:04	
Dibromofluoromethane	103	89-119	10/30/11 19:04	
Toluene-d8	106	87-121	10/30/11 19:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111026
Lab Code: R1106024-034

Service Request: R1106024
Date Collected: 10/26/11 0923
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	39		5.0	5	NA	11/7/11 14:40		268433	
Ethene	110		5.0	5	NA	11/7/11 14:40		268433	
Methane	330		10	5	NA	11/7/11 14:40		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 0923
Date Received: 10/27/11
Date Analyzed: 11/12/11 00:19

Sample Name: LC34-RW0007-038.5-20111026
Lab Code: R1106024-034

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111111\X0006756.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	2.5	U	2.5	
64-19-7	Acetic Acid	270		5.0	
107-92-6	Butanoic Acid (Butyric Acid)	270		10	
50-21-5	Lactic Acid	5.0	U	5.0	
79-09-4	Propionic Acid	17		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Service Request: R1106024
Date Collected: 10/26/11 1005
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	288	mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	4.5	mg/L	1.0	10	NA	10/27/11 21:20	
Carbon, Total Organic (TOC), Average	9060A	65.0	mg/L	4.0	4	NA	11/1/11 04:13	
Chloride	300.0	632	mg/L	20	100	NA	10/28/11 14:13	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	10/27/11 14:45	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	10/27/11 21:20	
Nitrite as Nitrogen	300.0	10 U	mg/L	10	100	NA	10/28/11 14:13	*
Sulfate	300.0	14.2	mg/L	2.0	10	NA	10/27/11 21:20	
Sulfide, Total	SM 4500-S2- F	14.7	mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111026 Dissolved
Lab Code: R1106024-037

Service Request: R1106024
Date Collected: 10/26/11 1005
Date Received: 10/27/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 11:15	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/4/11 11:15	
Manganese, Dissolved	6010C	15		µg/L	10	1	10/31/11	11/4/11 11:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20111026
 Lab Code: R1106024-036

Service Request: R1106024
 Date Collected: 10/26/11 1005
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	50	U	50	2.4	10	NA	10/29/11 11:18		267270	
1,1,2,2-Tetrachloroethane	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,1,2-Trichloroethane	50	U	50	2.4	10	NA	10/29/11 11:18		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	1200		50	3.1	10	NA	10/29/11 11:18		267270	
1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,1-Dichloroethene (1,1-DCE)	50	U	50	2.9	10	NA	10/29/11 11:18		267270	
1,2,4-Trichlorobenzene	50	U	50	2.6	10	NA	10/29/11 11:18		267270	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	10	NA	10/29/11 11:18		267270	
1,2-Dibromoethane	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,2-Dichlorobenzene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,2-Dichloroethane	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,2-Dichloropropane	50	U	50	2.9	10	NA	10/29/11 11:18		267270	
1,3-Dichlorobenzene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
1,4-Dichlorobenzene	50	U	.50	2.0	10	NA	10/29/11 11:18		267270	
n-Butanol	2500	U	2500	110	10	NA	10/29/11 11:18		267270	
2-Butanone (MEK)	100	U	100	5.1	10	NA	10/29/11 11:18		267270	
2-Hexanone	100	U	100	3.5	10	NA	10/29/11 11:18		267270	
4-Methyl-2-pentanone	100	U	100	2.7	10	NA	10/29/11 11:18		267270	
Acetone	200	U	200	9.8	10	NA	10/29/11 11:18		267270	
Benzene	50	U	50	2.1	10	NA	10/29/11 11:18		267270	
Bromodichloromethane	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Bromoform	50	U	50	2.7	10	NA	10/29/11 11:18		267270	
Bromomethane	50	U	50	3.1	10	NA	10/29/11 11:18		267270	
Carbon Disulfide	100	U	100	2.0	10	NA	10/29/11 11:18		267270	
Carbon Tetrachloride	50	U	50	2.7	10	NA	10/29/11 11:18		267270	
Chlorobenzene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Chloroethane	50	U	50	3.1	10	NA	10/29/11 11:18		267270	
Chloroform	50	U	50	2.2	10	NA	10/29/11 11:18		267270	
Chloromethane	50	U	50	2.4	10	NA	10/29/11 11:18		267270	
Cyclohexane	100	U	100	2.4	10	NA	10/29/11 11:18		267270	
Dibromochloromethane	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	10	NA	10/29/11 11:18		267270	
Dichloromethane	50	U	50	2.2	10	NA	10/29/11 11:18		267270	
Ethylbenzene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Isopropylbenzene (Cumene)	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Methyl Acetate	100	U	100	2.4	10	NA	10/29/11 11:18		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Service Request: R1106024
Date Collected: 10/26/11 1005
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Methylcyclohexane	100	U	100	2.5	10	NA	10/29/11 11:18		267270	
Styrene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Tetrachloroethene (PCE)	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Toluene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Trichloroethene (TCE)	1900		50	2.4	10	NA	10/29/11 11:18		267270	
Trichlorofluoromethane (CFC 11)	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
Vinyl Chloride	630		50	2.4	10	NA	10/29/11 11:18		267270	
cis-1,2-Dichloroethene	1700		50	2.0	10	NA	10/29/11 11:18		267270	
cis-1,3-Dichloropropene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
m,p-Xylenes	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
n-Butyl Acetate	50	U	50	2.1	10	NA	10/29/11 11:18		267270	
o-Xylene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	
trans-1,2-Dichloroethene	12	I	50	2.0	10	NA	10/29/11 11:18		267270	
trans-1,3-Dichloropropene	50	U	50	2.0	10	NA	10/29/11 11:18		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/29/11 11:18	
Dibromofluoromethane	103	89-119	10/29/11 11:18	
Toluene-d8	104	87-121	10/29/11 11:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Service Request: R1106024
Date Collected: 10/26/11 1005
Date Received: 10/27/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	8.8		5.0	5	NA	11/7/11 14:49		268433	
Ethene	95		5.0	5	NA	11/7/11 14:49		268433	
Methane	400		10	5	NA	11/7/11 14:49		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1005
Date Received: 10/27/11
Date Analyzed: 11/12/11 05:59

Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\111111\X0006762.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	130	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	19	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.4	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Service Request: R1106024
Date Collected: 10/26/11 1100
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	285		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	2.7		mg/L	1.0	10	NA	10/27/11 21:34	
Carbon, Total Organic (TOC), Average	9060A	31.1		mg/L	2.0	2	NA	11/1/11 04:53	
Chloride	300.0	65.4		mg/L	2.0	10	NA	10/27/11 21:34	
Iodide	300.0	2.5		mg/L	2.0	10	NA	10/27/11 14:53	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/27/11 21:34	
Nitrite as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/27/11 21:34	
Sulfate	300.0	30.9		mg/L	2.0	10	NA	10/27/11 21:34	
Sulfide, Total	SM 4500-S2- F	2.7		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20111026 Dissolved
Lab Code: R1106024-039

Service Request: R1106024
Date Collected: 10/26/11 1100
Date Received: 10/27/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 11:31	
Iron, Dissolved	6010C	550		µg/L	100	1	10/31/11	11/4/11 11:31	
Manganese, Dissolved	6010C	100		µg/L	10	1	10/31/11	11/4/11 11:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0002I-027.5-20111026
 Lab Code: R1106024-038

Service Request: R1106024
 Date Collected: 10/26/11 1100
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	10/30/11 19:34		267361	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,1,2-Trichloroethane	500	U	500	23	100	NA	10/30/11 19:34		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	34000		1300	78	250	NA	10/31/11 16:49		267468	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	10/30/11 19:34		267361	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	10/30/11 19:34		267361	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	10/30/11 19:34		267361	
1,2-Dibromoethane	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,2-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,2-Dichloroethane	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,2-Dichloropropane	500	U	500	29	100	NA	10/30/11 19:34		267361	
1,3-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:34		267361	
1,4-Dichlorobenzene	500	U	500	20	100	NA	10/30/11 19:34		267361	
n-Butanol	25000	U	25000	1100	100	NA	10/30/11 19:34		267361	
2-Butanone (MEK)	1000	U	1000	51	100	NA	10/30/11 19:34		267361	
2-Hexanone	1000	U	1000	35	100	NA	10/30/11 19:34		267361	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	10/30/11 19:34		267361	
Acetone	2000	U	2000	98	100	NA	10/30/11 19:34		267361	
Benzene	500	U	500	21	100	NA	10/30/11 19:34		267361	
Bromodichloromethane	500	U	500	20	100	NA	10/30/11 19:34		267361	
Bromoform	500	U	500	27	100	NA	10/30/11 19:34		267361	
Bromomethane	500	U	500	31	100	NA	10/30/11 19:34		267361	
Carbon Disulfide	1000	U	1000	20	100	NA	10/30/11 19:34		267361	
Carbon Tetrachloride	500	U	500	27	100	NA	10/30/11 19:34		267361	
Chlorobenzene	500	U	500	20	100	NA	10/30/11 19:34		267361	
Chloroethane	500	U	500	31	100	NA	10/30/11 19:34		267361	
Chloroform	500	U	500	22	100	NA	10/30/11 19:34		267361	
Chloromethane	500	U	500	24	100	NA	10/30/11 19:34		267361	
Cyclohexane	1000	U	1000	24	100	NA	10/30/11 19:34		267361	
Dibromochloromethane	500	U	500	20	100	NA	10/30/11 19:34		267361	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	10/30/11 19:34		267361	
Dichloromethane	500	U	500	22	100	NA	10/30/11 19:34		267361	
Ethylbenzene	500	U	500	20	100	NA	10/30/11 19:34		267361	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	10/30/11 19:34		267361	
Methyl Acetate	1000	U	1000	23	100	NA	10/30/11 19:34		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Service Request: R1106024
Date Collected: 10/26/11 1100
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	10/30/11 19:34		267361	
Methylcyclohexane	1000	U	1000	25	100	NA	10/30/11 19:34		267361	
Styrene	500	U	500	20	100	NA	10/30/11 19:34		267361	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	10/30/11 19:34		267361	
Toluene	500	U	500	20	100	NA	10/30/11 19:34		267361	
Trichloroethene (TCE)	57	I	500	23	100	NA	10/30/11 19:34		267361	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	10/30/11 19:34		267361	
Vinyl Chloride	930		500	23	100	NA	10/30/11 19:34		267361	
cis-1,2-Dichloroethene	15000		500	20	100	NA	10/30/11 19:34		267361	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 19:34		267361	
m,p-Xylenes	500	U	500	20	100	NA	10/30/11 19:34		267361	
n-Butyl Acetate	500	U	500	21	100	NA	10/30/11 19:34		267361	
o-Xylene	500	U	500	20	100	NA	10/30/11 19:34		267361	
trans-1,2-Dichloroethene	320	I	500	20	100	NA	10/30/11 19:34		267361	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	10/30/11 19:34		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	85-122	10/30/11 19:34	
Dibromofluoromethane	103	89-119	10/30/11 19:34	
Toluene-d8	106	87-121	10/30/11 19:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Service Request: R1106024
Date Collected: 10/26/11 1100
Date Received: 10/27/11

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	6.2		1.0	1	NA	11/7/11 15:05		268433	
Ethene	29		1.0	1	NA	11/7/11 15:05		268433	
Methane	69		2.0	1	NA	11/7/11 15:05		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1100
Date Received: 10/27/11
Date Analyzed: 11/12/11 07:52

Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\111111\X0006764.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	55	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	13	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	2.7	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	642		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	20.3		mg/L	1.0	10	NA	10/28/11 00:09	
Carbon, Total Organic (TOC), Average	9060A	590		mg/L	100	100	NA	10/29/11 08:21	
Chloride	300.0	227		mg/L	12	60	NA	10/28/11 14:27	
Iodide	300.0	18.3		mg/L	2.0	10	NA	10/27/11 15:16	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/28/11 00:09	
Nitrite as Nitrogen	300.0	6.0	U	mg/L	6.0	60	NA	10/28/11 14:27	*
Sulfate	300.0	8.0		mg/L	2.0	10	NA	10/28/11 00:09	
Sulfide, Total	SM 4500-S2- F	10.5		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20111026 Dissolved
Lab Code: R1106024-041

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/4/11 11:36	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/31/11	11/4/11 11:36	
Manganese, Dissolved	6010C	98	µg/L	10	1	10/31/11	11/4/11 11:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	10/31/11 17:19		267468	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,1,2-Trichloroethane	500	U	500	23	100	NA	10/31/11 17:19		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	3700		500	31	100	NA	10/31/11 17:19		267468	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	10/31/11 17:19		267468	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	10/31/11 17:19		267468	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	10/31/11 17:19		267468	
1,2-Dibromoethane	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,2-Dichlorobenzene	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,2-Dichloroethane	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,2-Dichloropropane	500	U	500	29	100	NA	10/31/11 17:19		267468	
1,3-Dichlorobenzene	500	U	500	20	100	NA	10/31/11 17:19		267468	
1,4-Dichlorobenzene	500	U	500	20	100	NA	10/31/11 17:19		267468	
n-Butanol	2700	I	25000	1100	100	NA	10/31/11 17:19		267468	
2-Butanone (MEK)	1000	U	1000	51	100	NA	10/31/11 17:19		267468	
2-Hexanone	1000	U	1000	35	100	NA	10/31/11 17:19		267468	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	10/31/11 17:19		267468	
Acetone	2000	U	2000	98	100	NA	10/31/11 17:19		267468	
Benzene	500	U	500	21	100	NA	10/31/11 17:19		267468	
Bromodichloromethane	500	U	500	20	100	NA	10/31/11 17:19		267468	
Bromoform	500	U	500	27	100	NA	10/31/11 17:19		267468	
Bromomethane	500	U	500	31	100	NA	10/31/11 17:19		267468	
Carbon Disulfide	1000	U	1000	20	100	NA	10/31/11 17:19		267468	
Carbon Tetrachloride	500	U	500	27	100	NA	10/31/11 17:19		267468	
Chlorobenzene	500	U	500	20	100	NA	10/31/11 17:19		267468	
Chloroethane	500	U	500	31	100	NA	10/31/11 17:19		267468	
Chloroform	500	U	500	22	100	NA	10/31/11 17:19		267468	
Chloromethane	500	U	500	24	100	NA	10/31/11 17:19		267468	
Cyclohexane	1000	U	1000	24	100	NA	10/31/11 17:19		267468	
Dibromochloromethane	500	U	500	20	100	NA	10/31/11 17:19		267468	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	10/31/11 17:19		267468	
Dichloromethane	500	U	500	22	100	NA	10/31/11 17:19		267468	
Ethylbenzene	500	U	500	20	100	NA	10/31/11 17:19		267468	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	10/31/11 17:19		267468	
Methyl Acetate	1000	U	1000	23	100	NA	10/31/11 17:19		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	10/31/11 17:19		267468	
Methylcyclohexane	1000	U	1000	25	100	NA	10/31/11 17:19		267468	
Styrene	500	U	500	20	100	NA	10/31/11 17:19		267468	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	10/31/11 17:19		267468	
Toluene	500	U	500	20	100	NA	10/31/11 17:19		267468	
Trichloroethene (TCE)	73	I	500	23	100	NA	10/31/11 17:19		267468	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	10/31/11 17:19		267468	
Vinyl Chloride	4000		500	23	100	NA	10/31/11 17:19		267468	
cis-1,2-Dichloroethene	16000		500	20	100	NA	10/31/11 17:19		267468	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	10/31/11 17:19		267468	
m,p-Xylenes	500	U	500	20	100	NA	10/31/11 17:19		267468	
n-Butyl Acetate	500	U	500	21	100	NA	10/31/11 17:19		267468	
o-Xylene	500	U	500	20	100	NA	10/31/11 17:19		267468	
trans-1,2-Dichloroethene	290	I	500	20	100	NA	10/31/11 17:19		267468	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	10/31/11 17:19		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	10/31/11 17:19	
Dibromofluoromethane	103	89-119	10/31/11 17:19	
Toluene-d8	103	87-121	10/31/11 17:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	48		2.0	2	NA	11/7/11 15:16		268433	
Ethene	120		2.0	2	NA	11/7/11 15:16		268433	
Methane	230		8.0	4	NA	11/7/11 15:28		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11 1232
Date Received: 10/27/11
Date Analyzed: 11/12/11 14:28

Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\111111\X0006771.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	390	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	810	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	49	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20111026
 Lab Code: R1106024-042

Service Request: R1106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	244		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	3.5		mg/L	1.0	10	NA	10/28/11 00:23	
Carbon, Total Organic (TOC), Average	9060A	42.7		mg/L	4.0	4	NA	11/2/11 19:17	
Chloride	300.0	650		mg/L	20	100	NA	10/28/11 11:53	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	10/27/11 15:24	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/28/11 14:41	*
Nitrite as Nitrogen	300.0	10	U	mg/L	10	100	NA	10/28/11 11:53	
Sulfate	300.0	43.3		mg/L	2.0	10	NA	10/28/11 00:23	
Sulfide, Total	SM 4500-S2- F	9.1		mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20111026 Dissolved
 Lab Code: R1106024-043

Service Request: R1106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 11:42	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/4/11 11:42	
Manganese, Dissolved	6010C	13		µg/L	10	1	10/31/11	11/4/11 11:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: EST/CP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20111026
 Lab Code: RI106024-042

Service Request: RI106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/31/11 15:19		267468	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/31/11 15:19		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.51	I	5.0	0.31	1	NA	10/31/11 15:19		267468	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/31/11 15:19		267468	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/31/11 15:19		267468	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/31/11 15:19		267468	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/31/11 15:19		267468	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
n-Butanol	250	U	250	11	1	NA	10/31/11 15:19		267468	
2-Butanone (MEK)	0.53	I	10	0.51	1	NA	10/31/11 15:19		267468	
2-Hexanone	10	U	10	0.35	1	NA	10/31/11 15:19		267468	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/31/11 15:19		267468	
Acetone	1.8	I	20	0.98	1	NA	10/31/11 15:19		267468	
Benzene	5.0	U	5.0	0.21	1	NA	10/31/11 15:19		267468	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Bromoform	5.0	U	5.0	0.27	1	NA	10/31/11 15:19		267468	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/31/11 15:19		267468	
Carbon Disulfide	1.5	I	10	0.20	1	NA	10/31/11 15:19		267468	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/31/11 15:19		267468	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/31/11 15:19		267468	
Chloroform	5.0	U	5.0	0.22	1	NA	10/31/11 15:19		267468	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/31/11 15:19		267468	
Cyclohexane	10	U	10	0.24	1	NA	10/31/11 15:19		267468	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/31/11 15:19		267468	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/31/11 15:19		267468	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Methyl Acetate	10	U	10	0.23	1	NA	10/31/11 15:19		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-IW0002D1-052.5-20111026
 Lab Code: R1106024-042

Service Request: R1106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Methylcyclohexane	10	U	10	0.25	1	NA	10/31/11 15:19		267468	
Styrene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Toluene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Trichloroethene (TCE)	0.81	I	5.0	0.23	1	NA	10/31/11 15:19		267468	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
Vinyl Chloride	60		5.0	0.23	1	NA	10/31/11 15:19		267468	
cis-1,2-Dichloroethene	4.3	I	5.0	0.20	1	NA	10/31/11 15:19		267468	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
n-Butyl Acetate	0.36	I	5.0	0.21	1	NA	10/31/11 15:19		267468	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	
trans-1,2-Dichloroethene	1.5	I	5.0	0.20	1	NA	10/31/11 15:19		267468	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 15:19		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	10/31/11 15:19	
Dibromofluoromethane	103	89-119	10/31/11 15:19	
Toluene-d8	103	87-121	10/31/11 15:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-1W0002D1-052.5-20111026
 Lab Code: R1106024-042

Service Request: R1106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11
 Units: µg/l.
 Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	2.9		1.0	1	NA	11/7/11 15:38		268433	
Ethene	140		5.0	5	NA	11/7/11 15:48		268433	
Methane	390		10	5	NA	11/7/11 15:48		268433	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Collected: 10/26/11 1340
 Date Received: 10/27/11
 Date Analyzed: 11/12/11 12:35

Sample Name: LC34-IW0002D1-052.5-20111026
 Lab Code: R1106024-042

Units: mg/L
 Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
 Data File Name: J:\ACQU\DATA\HPLC05\DATA\111111\X0006769.D\

Analysis Lot: 269418
 Instrument Name: R-HPLC-05
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	93	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	5.0	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.2	mg/L	1.0	10	NA	11/8/11 17:20	
Carbon, Total Organic (TOC), Average	9060A	10.6	mg/L	1.0	1	NA	11/4/11 20:18	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	11/11/11 11:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	2500	U	2500	120	500	NA	10/31/11 17:49		267468	
1,1,2,2-Tetrachloroethane	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,1,2-Trichloroethane	2500	U	2500	120	500	NA	10/31/11 17:49		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	2500	U	2500	160	500	NA	10/31/11 17:49		267468	
1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	500	NA	10/31/11 17:49		267468	
1,2,4-Trichlorobenzene	2500	U	2500	130	500	NA	10/31/11 17:49		267468	
1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	500	NA	10/31/11 17:49		267468	
1,2-Dibromoethane	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,2-Dichlorobenzene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,2-Dichloroethane	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,2-Dichloropropane	2500	U	2500	140	500	NA	10/31/11 17:49		267468	
1,3-Dichlorobenzene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
1,4-Dichlorobenzene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
n-Butanol	130000	U	130000	5300	500	NA	10/31/11 17:49		267468	
2-Butanone (MEK)	5000	U	5000	260	500	NA	10/31/11 17:49		267468	
2-Hexanone	5000	U	5000	180	500	NA	10/31/11 17:49		267468	
4-Methyl-2-pentanone	5000	U	5000	140	500	NA	10/31/11 17:49		267468	
Acetone	10000	U	10000	490	500	NA	10/31/11 17:49		267468	
Benzene	2500	U	2500	110	500	NA	10/31/11 17:49		267468	
Bromodichloromethane	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Bromoform	2500	U	2500	140	500	NA	10/31/11 17:49		267468	
Bromomethane	2500	U	2500	160	500	NA	10/31/11 17:49		267468	
Carbon Disulfide	5000	U	5000	100	500	NA	10/31/11 17:49		267468	
Carbon Tetrachloride	2500	U	2500	140	500	NA	10/31/11 17:49		267468	
Chlorobenzene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Chloroethane	2500	U	2500	160	500	NA	10/31/11 17:49		267468	
Chloroform	2500	U	2500	110	500	NA	10/31/11 17:49		267468	
Chloromethane	2500	U	2500	120	500	NA	10/31/11 17:49		267468	
Cyclohexane	5000	U	5000	120	500	NA	10/31/11 17:49		267468	
Dibromochloromethane	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	500	NA	10/31/11 17:49		267468	
Dichloromethane	2500	U	2500	110	500	NA	10/31/11 17:49		267468	
Ethylbenzene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Isopropylbenzene (Cumene)	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Methyl Acetate	5000	U	5000	120	500	NA	10/31/11 17:49		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Methylcyclohexane	5000	U	5000	130	500	NA	10/31/11 17:49		267468	
Styrene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Tetrachloroethene (PCE)	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Toluene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Trichloroethene (TCE)	2500	U	2500	120	500	NA	10/31/11 17:49		267468	
Trichlorofluoromethane (CFC 11)	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
Vinyl Chloride	6900		2500	120	500	NA	10/31/11 17:49		267468	
cis-1,2-Dichloroethene	48000		2500	100	500	NA	10/31/11 17:49		267468	
cis-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
m,p-Xylenes	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
n-Butyl Acetate	2500	U	2500	110	500	NA	10/31/11 17:49		267468	
o-Xylene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	
trans-1,2-Dichloroethene	1300	I	2500	100	500	NA	10/31/11 17:49		267468	
trans-1,3-Dichloropropene	2500	U	2500	100	500	NA	10/31/11 17:49		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	10/31/11 17:49	
Dibromofluoromethane	103	89-119	10/31/11 17:49	
Toluene-d8	103	87-121	10/31/11 17:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	2.3		1.0	1	NA	11/8/11 15:29		268565	
Ethene	99		1.0	1	NA	11/8/11 15:29		268565	
Methane	95		2.0	1	NA	11/8/11 15:29		268565	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/14/11 14:53

Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\111411\X0006779.D\

Analysis Lot: 269468
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	16	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.7	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20111027
Lab Code: R1106024-045

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	313		mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	1.5		mg/L	1.0	10	NA	11/4/11 20:40	
Carbon, Total Organic (TOC), Average	9060A	14.5		mg/L	1.0	1	NA	11/4/11 20:58	
Chloride	300.0	360		mg/L	16	80	NA	10/29/11 15:58	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	11/11/11 11:47	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	10/28/11 22:10	
Nitrite as Nitrogen	300.0	8.0	U	mg/L	8.0	80	NA	10/29/11 15:58	*
Sulfate	300.0	13.3		mg/L	2.0	10	NA	10/28/11 22:10	
Sulfide, Total	SM 4500-S2- F	4.9		mg/L	1.0	1	NA	11/1/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20111027
Lab Code: R1106024-045

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	11/1/11 17:26		267722	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,1,2-Trichloroethane	250	U	250	12	50	NA	11/1/11 17:26		267722	
1,1,2-Trichloro-1,2,2-trifluoroethane	23	I	250	16	50	NA	11/1/11 17:26		267722	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,1-Dichloroethene (1,1-DCE)	250	U	250	15	50	NA	11/1/11 17:26		267722	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	11/1/11 17:26		267722	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	11/1/11 17:26		267722	
1,2-Dibromoethane	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,2-Dichlorobenzene	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,2-Dichloroethane	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,2-Dichloropropane	250	U	250	15	50	NA	11/1/11 17:26		267722	
1,3-Dichlorobenzene	250	U	250	10	50	NA	11/1/11 17:26		267722	
1,4-Dichlorobenzene	250	U	250	10	50	NA	11/1/11 17:26		267722	
n-Butanol	13000	U	13000	530	50	NA	11/1/11 17:26		267722	
2-Butanone (MEK)	500	U	500	26	50	NA	11/1/11 17:26		267722	
2-Hexanone	500	U	500	18	50	NA	11/1/11 17:26		267722	
4-Methyl-2-pentanone	500	U	500	14	50	NA	11/1/11 17:26		267722	
Acetone	1000	U	1000	49	50	NA	11/1/11 17:26		267722	
Benzene	250	U	250	11	50	NA	11/1/11 17:26		267722	
Bromodichloromethane	250	U	250	10	50	NA	11/1/11 17:26		267722	
Bromoform	250	U	250	14	50	NA	11/1/11 17:26		267722	
Bromomethane	250	U	250	16	50	NA	11/1/11 17:26		267722	
Carbon Disulfide	500	U	500	10	50	NA	11/1/11 17:26		267722	
Carbon Tetrachloride	250	U	250	14	50	NA	11/1/11 17:26		267722	
Chlorobenzene	250	U	250	10	50	NA	11/1/11 17:26		267722	
Chloroethane	250	U	250	16	50	NA	11/1/11 17:26		267722	
Chloroform	250	U	250	11	50	NA	11/1/11 17:26		267722	
Chloromethane	250	U	250	12	50	NA	11/1/11 17:26		267722	
Cyclohexane	500	U	500	12	50	NA	11/1/11 17:26		267722	
Dibromochloromethane	250	U	250	10	50	NA	11/1/11 17:26		267722	
Dichlorodifluoromethane (CFC 12)	250	U	250	29	50	NA	11/1/11 17:26		267722	
Dichloromethane	250	U	250	11	50	NA	11/1/11 17:26		267722	
Ethylbenzene	250	U	250	10	50	NA	11/1/11 17:26		267722	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	11/1/11 17:26		267722	
Methyl Acetate	500	U	500	12	50	NA	11/1/11 17:26		267722	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20111027
Lab Code: R1106024-045

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	250	U	250	10	50	NA	11/1/11 17:26		267722	
Methylcyclohexane	500	U	500	13	50	NA	11/1/11 17:26		267722	
Styrene	250	U	250	10	50	NA	11/1/11 17:26		267722	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	11/1/11 17:26		267722	
Toluene	250	U	250	10	50	NA	11/1/11 17:26		267722	
Trichloroethene (TCE)	250	U	250	12	50	NA	11/1/11 17:26		267722	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	11/1/11 17:26		267722	
Vinyl Chloride	9400		250	12	50	NA	11/1/11 17:26		267722	
cis-1,2-Dichloroethene	1800		250	10	50	NA	11/1/11 17:26		267722	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	11/1/11 17:26		267722	
m,p-Xylenes	250	U	250	10	50	NA	11/1/11 17:26		267722	
n-Butyl Acetate	250	U	250	11	50	NA	11/1/11 17:26		267722	
o-Xylene	250	U	250	10	50	NA	11/1/11 17:26		267722	
trans-1,2-Dichloroethene	180	I	250	10	50	NA	11/1/11 17:26		267722	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	11/1/11 17:26		267722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	11/1/11 17:26	
Dibromofluoromethane	103	89-119	11/1/11 17:26	
Toluene-d8	104	87-121	11/1/11 17:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20111027
Lab Code: R1106024-045

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	12		5.0	5	NA	11/8/11 15:39		268565	
Ethene	770		10	10	NA	11/8/11 15:49		268565	
Methane	300		10	5	NA	11/8/11 15:39		268565	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/14/11 16:46

Sample Name: LC34-BW0003C-038.5-20111027
Lab Code: R1106024-045

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111411\X0006781.D\

Analysis Lot: 269468
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	25	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20111027
Lab Code: R1106024-046

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	8.8	mg/L	1.0	10	NA	11/8/11 18:45	
Carbon, Total Organic (TOC), Average	9060A	56.3	mg/L	4.0	4	NA	11/3/11 00:06	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	11/11/11 11:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0003E-052.5-20111027
 Lab Code: R1106024-046

Service Request: R1106024
 Date Collected: 10/27/11
 Date Received: 10/28/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	11/2/11 13:07		267849	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	11/2/11 13:07		267849	
1,1,2-Trichloro-1,2,2-trifluoroethane	4.9	I	5.0	0.31	1	NA	11/2/11 13:07		267849	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	11/2/11 13:07		267849	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	11/2/11 13:07		267849	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	11/2/11 13:07		267849	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	11/2/11 13:07		267849	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
n-Butanol	70	I	250	11	1	NA	11/2/11 13:07		267849	
2-Butanone (MEK)	10	U	10	0.51	1	NA	11/2/11 13:07		267849	
2-Hexanone	10	U	10	0.35	1	NA	11/2/11 13:07		267849	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	11/2/11 13:07		267849	
Acetone	20	U	20	0.98	1	NA	11/2/11 13:07		267849	
Benzene	5.0	U	5.0	0.21	1	NA	11/2/11 13:07		267849	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Bromoform	5.0	U	5.0	0.27	1	NA	11/2/11 13:07		267849	
Bromomethane	5.0	U	5.0	0.31	1	NA	11/2/11 13:07		267849	
Carbon Disulfide	0.88	I	10	0.20	1	NA	11/2/11 13:07		267849	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	11/2/11 13:07		267849	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Chloroethane	5.0	U	5.0	0.31	1	NA	11/2/11 13:07		267849	
Chloroform	5.0	U	5.0	0.22	1	NA	11/2/11 13:07		267849	
Chloromethane	5.0	U	5.0	0.24	1	NA	11/2/11 13:07		267849	
Cyclohexane	10	U	10	0.24	1	NA	11/2/11 13:07		267849	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	11/2/11 13:07		267849	
Dichloromethane	5.0	U	5.0	0.22	1	NA	11/2/11 13:07		267849	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Methyl Acetate	10	U	10	0.23	1	NA	11/2/11 13:07		267849	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20111027
Lab Code: R1106024-046

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Methylcyclohexane	10	U	10	0.25	1	NA	11/2/11 13:07		267849	
Styrene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Toluene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Trichloroethene (TCE)	2.9	I	5.0	0.23	1	NA	11/2/11 13:07		267849	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
Vinyl Chloride	110		5.0	0.23	1	NA	11/2/11 13:07		267849	
cis-1,2-Dichloroethene	20		5.0	0.20	1	NA	11/2/11 13:07		267849	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
n-Butyl Acetate	0.40	I	5.0	0.21	1	NA	11/2/11 13:07		267849	
o-Xylene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	
trans-1,2-Dichloroethene	0.41	I	5.0	0.20	1	NA	11/2/11 13:07		267849	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/2/11 13:07		267849	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	11/2/11 13:07	
Dibromofluoromethane	103	89-119	11/2/11 13:07	
Toluene-d8	105	87-121	11/2/11 13:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20111027
Lab Code: R1106024-046

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	1.0	U	1.0	1	NA	11/8/11 15:59		268565	
Ethene	4.1		1.0	1	NA	11/8/11 15:59		268565	
Methane	2000		100	50	NA	11/9/11 10:09		268842	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/14/11 18:40

Sample Name: LC34-BW0003E-052.5-20111027
Lab Code: R1106024-046

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111411\X0006783.D\

Analysis Lot: 269468
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	57	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	29	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	2.7	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20111027
Lab Code: R1106024-047

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	3.1	mg/L	1.0	10	NA	11/4/11 21:08	
Carbon, Total Organic (TOC), Average	9060A	30.1	mg/L	4.0	4	NA	11/4/11 21:37	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	11/11/11 12:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-BW0003F-059.5-20111027
 Lab Code: R1106024-047

Service Request: R1106024
 Date Collected: 10/27/11
 Date Received: 10/28/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/31/11 19:19		267468	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/31/11 19:19		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.92	I	5.0	0.31	1	NA	10/31/11 19:19		267468	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,1-Dichloroethene (1,1-DCE)	0.38	I	5.0	0.29	1	NA	10/31/11 19:19		267468	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/31/11 19:19		267468	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/31/11 19:19		267468	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/31/11 19:19		267468	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
n-Butanol	250	U	250	11	1	NA	10/31/11 19:19		267468	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/31/11 19:19		267468	
2-Hexanone	10	U	10	0.35	1	NA	10/31/11 19:19		267468	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/31/11 19:19		267468	
Acetone	20	U	20	0.98	1	NA	10/31/11 19:19		267468	
Benzene	5.0	U	5.0	0.21	1	NA	10/31/11 19:19		267468	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Bromoform	5.0	U	5.0	0.27	1	NA	10/31/11 19:19		267468	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/31/11 19:19		267468	
Carbon Disulfide	1.2	I	10	0.20	1	NA	10/31/11 19:19		267468	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/31/11 19:19		267468	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/31/11 19:19		267468	
Chloroform	5.0	U	5.0	0.22	1	NA	10/31/11 19:19		267468	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/31/11 19:19		267468	
Cyclohexane	10	U	10	0.24	1	NA	10/31/11 19:19		267468	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/31/11 19:19		267468	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/31/11 19:19		267468	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Methyl Acetate	10	U	10	0.23	1	NA	10/31/11 19:19		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20111027
Lab Code: R1106024-047

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Methylcyclohexane	10	U	10	0.25	1	NA	10/31/11 19:19		267468	
Styrene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Toluene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Trichloroethene (TCE)	0.50	I	5.0	0.23	1	NA	10/31/11 19:19		267468	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
Vinyl Chloride	190		5.0	0.23	1	NA	10/31/11 19:19		267468	
cis-1,2-Dichloroethene	210		10	0.40	2	NA	11/1/11 18:24		267722	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/31/11 19:19		267468	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	
trans-1,2-Dichloroethene	1.1	I	5.0	0.20	1	NA	10/31/11 19:19		267468	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 19:19		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	10/31/11 19:19	
Dibromofluoromethane	104	89-119	10/31/11 19:19	
Toluene-d8	103	87-121	10/31/11 19:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20111027
Lab Code: R1106024-047

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.5		1.0	1	NA	11/8/11 16:11		268565	
Ethene	5.1		1.0	1	NA	11/8/11 16:11		268565	
Methane	170		4.0	2	NA	11/8/11 16:20		268565	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/14/11 20:33

Sample Name: LC34-BW0003F-059.5-20111027
Lab Code: R1106024-047

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111411\X0006785.D\

Analysis Lot: 269468
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	65	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	4.6	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: LC34-TB-20111027
 Lab Code: R1106024-048

Service Request: R1106024
 Date Collected: 10/27/11
 Date Received: 10/28/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/31/11 14:20		267468	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/31/11 14:20		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:20		267468	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/31/11 14:20		267468	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/31/11 14:20		267468	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/31/11 14:20		267468	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/31/11 14:20		267468	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
n-Butanol	250	U	250	11	1	NA	10/31/11 14:20		267468	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/31/11 14:20		267468	
2-Hexanone	10	U	10	0.35	1	NA	10/31/11 14:20		267468	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/31/11 14:20		267468	
Acetone	20	U	20	0.98	1	NA	10/31/11 14:20		267468	
Benzene	5.0	U	5.0	0.21	1	NA	10/31/11 14:20		267468	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Bromoform	5.0	U	5.0	0.27	1	NA	10/31/11 14:20		267468	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:20		267468	
Carbon Disulfide	10	U	10	0.20	1	NA	10/31/11 14:20		267468	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/31/11 14:20		267468	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/31/11 14:20		267468	
Chloroform	5.0	U	5.0	0.22	1	NA	10/31/11 14:20		267468	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/31/11 14:20		267468	
Cyclohexane	10	U	10	0.24	1	NA	10/31/11 14:20		267468	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/31/11 14:20		267468	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/31/11 14:20		267468	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Methyl Acetate	10	U	10	0.23	1	NA	10/31/11 14:20		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: LC34-TB-20111027
Lab Code: R1106024-048

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Methylcyclohexane	10	U	10	0.25	1	NA	10/31/11 14:20		267468	
Styrene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Toluene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/31/11 14:20		267468	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/31/11 14:20		267468	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/31/11 14:20		267468	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 14:20		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	10/31/11 14:20	
Dibromofluoromethane	102	89-119	10/31/11 14:20	
Toluene-d8	103	87-121	10/31/11 14:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB1

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	10/26/11 15:45	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	10/29/11 06:22	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	10/26/11 15:45	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	10/27/11 10:33	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/26/11 15:45	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/26/11 15:45	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/26/11 15:45	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB2

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	11/8/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	10/26/11 20:43	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	10/31/11 14:17	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	10/27/11 20:24	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	10/27/11 14:06	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/26/11 20:43	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/27/11 20:24	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/26/11 20:43	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	10/28/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB3

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	10/27/11 20:24	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	11/2/11 16:38	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	10/28/11 09:44	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	11/11/11 10:50	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/27/11 20:24	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/28/11 09:44	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/27/11 20:24	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	11/1/11 10:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB4

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	11/4/11 16:55	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	11/3/11 17:27	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	10/29/11 13:33	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/28/11 09:44	
Nitrite as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/29/11 13:33	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/28/11 21:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB5

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	11/4/11 22:32	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	11/4/11 18:18	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	10/28/11 21:00	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	10/31/11 22:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB6

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	11/8/11 12:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB7

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	11/8/11 18:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB1

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 09:17	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/4/11 09:17	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 09:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB2

Service Request: R1106024
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 09:23	
Iron, Dissolved	6010C	100	U	µg/L	100	1	10/31/11	11/4/11 09:23	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	10/31/11	11/4/11 09:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB3

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/11/11 19:52	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/31/11	11/11/11 19:52	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/11/11 19:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106024-MB4

Service Request: R1106024
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/11/11 20:01	
Iron, Dissolved	6010C	100 U	µg/L	100	1	10/31/11	11/11/11 20:01	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	10/31/11	11/11/11 20:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1110942-01

Service Request: R1106024
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/28/11 15:17		267265	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/28/11 15:17		267265	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/28/11 15:17		267265	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/28/11 15:17		267265	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/28/11 15:17		267265	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/28/11 15:17		267265	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/28/11 15:17		267265	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
n-Butanol	250	U	250	11	1	NA	10/28/11 15:17		267265	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/28/11 15:17		267265	
2-Hexanone	10	U	10	0.35	1	NA	10/28/11 15:17		267265	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/28/11 15:17		267265	
Acetone	20	U	20	0.98	1	NA	10/28/11 15:17		267265	
Benzene	5.0	U	5.0	0.21	1	NA	10/28/11 15:17		267265	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Bromoform	5.0	U	5.0	0.27	1	NA	10/28/11 15:17		267265	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/28/11 15:17		267265	
Carbon Disulfide	10	U	10	0.20	1	NA	10/28/11 15:17		267265	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/28/11 15:17		267265	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/28/11 15:17		267265	
Chloroform	5.0	U	5.0	0.22	1	NA	10/28/11 15:17		267265	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/28/11 15:17		267265	
Cyclohexane	10	U	10	0.24	1	NA	10/28/11 15:17		267265	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/28/11 15:17		267265	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/28/11 15:17		267265	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Methyl Acetate	10	U	10	0.23	1	NA	10/28/11 15:17		267265	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1110942-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Methylcyclohexane	10	U	10	0.25	1	NA	10/28/11 15:17		267265	
Styrene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Toluene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/28/11 15:17		267265	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/28/11 15:17		267265	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/28/11 15:17		267265	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/28/11 15:17		267265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	10/28/11 15:17	
Dibromofluoromethane	101	89-119	10/28/11 15:17	
Toluene-d8	104	87-121	10/28/11 15:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1111029-01

Service Request: R1106024
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/29/11 02:53		267270	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/29/11 02:53		267270	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/29/11 02:53		267270	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/29/11 02:53		267270	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/29/11 02:53		267270	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/29/11 02:53		267270	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/29/11 02:53		267270	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
n-Butanol	25	I	250	11	1	NA	10/29/11 02:53		267270	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/29/11 02:53		267270	
2-Hexanone	10	U	10	0.35	1	NA	10/29/11 02:53		267270	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/29/11 02:53		267270	
Acetone	20	U	20	0.98	1	NA	10/29/11 02:53		267270	
Benzene	5.0	U	5.0	0.21	1	NA	10/29/11 02:53		267270	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Bromoform	5.0	U	5.0	0.27	1	NA	10/29/11 02:53		267270	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/29/11 02:53		267270	
Carbon Disulfide	10	U	10	0.20	1	NA	10/29/11 02:53		267270	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/29/11 02:53		267270	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/29/11 02:53		267270	
Chloroform	5.0	U	5.0	0.22	1	NA	10/29/11 02:53		267270	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/29/11 02:53		267270	
Cyclohexane	10	U	10	0.24	1	NA	10/29/11 02:53		267270	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/29/11 02:53		267270	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/29/11 02:53		267270	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Methyl Acetate	10	U	10	0.23	1	NA	10/29/11 02:53		267270	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111029-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Methylcyclohexane	10	U	10	0.25	1	NA	10/29/11 02:53		267270	
Styrene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Toluene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/29/11 02:53		267270	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/29/11 02:53		267270	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/29/11 02:53		267270	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/29/11 02:53		267270	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	10/29/11 02:53	
Dibromofluoromethane	102	89-119	10/29/11 02:53	
Toluene-d8	104	87-121	10/29/11 02:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111182-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/30/11 12:37		267361	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/30/11 12:37		267361	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/30/11 12:37		267361	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/30/11 12:37		267361	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/30/11 12:37		267361	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/30/11 12:37		267361	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/30/11 12:37		267361	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
n-Butanol	250	U	250	11	1	NA	10/30/11 12:37		267361	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/30/11 12:37		267361	
2-Hexanone	10	U	10	0.35	1	NA	10/30/11 12:37		267361	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/30/11 12:37		267361	
Acetone	20	U	20	0.98	1	NA	10/30/11 12:37		267361	
Benzene	5.0	U	5.0	0.21	1	NA	10/30/11 12:37		267361	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Bromoform	5.0	U	5.0	0.27	1	NA	10/30/11 12:37		267361	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/30/11 12:37		267361	
Carbon Disulfide	10	U	10	0.20	1	NA	10/30/11 12:37		267361	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/30/11 12:37		267361	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/30/11 12:37		267361	
Chloroform	5.0	U	5.0	0.22	1	NA	10/30/11 12:37		267361	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/30/11 12:37		267361	
Cyclohexane	10	U	10	0.24	1	NA	10/30/11 12:37		267361	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/30/11 12:37		267361	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/30/11 12:37		267361	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Methyl Acetate	10	U	10	0.23	1	NA	10/30/11 12:37		267361	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111182-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Methylcyclohexane	10	U	10	0.25	1	NA	10/30/11 12:37		267361	
Styrene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Toluene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/30/11 12:37		267361	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/30/11 12:37		267361	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/30/11 12:37		267361	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/30/11 12:37		267361	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	10/30/11 12:37	
Dibromofluoromethane	100	89-119	10/30/11 12:37	
Toluene-d8	104	87-121	10/30/11 12:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1111185-01

Service Request: R1106024
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	10/31/11 13:50		267468	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	10/31/11 13:50		267468	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	10/31/11 13:50		267468	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	10/31/11 13:50		267468	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	10/31/11 13:50		267468	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	10/31/11 13:50		267468	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	10/31/11 13:50		267468	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
n-Butanol	250	U	250	11	1	NA	10/31/11 13:50		267468	
2-Butanone (MEK)	10	U	10	0.51	1	NA	10/31/11 13:50		267468	
2-Hexanone	10	U	10	0.35	1	NA	10/31/11 13:50		267468	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	10/31/11 13:50		267468	
Acetone	20	U	20	0.98	1	NA	10/31/11 13:50		267468	
Benzene	5.0	U	5.0	0.21	1	NA	10/31/11 13:50		267468	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Bromoform	5.0	U	5.0	0.27	1	NA	10/31/11 13:50		267468	
Bromomethane	5.0	U	5.0	0.31	1	NA	10/31/11 13:50		267468	
Carbon Disulfide	10	U	10	0.20	1	NA	10/31/11 13:50		267468	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	10/31/11 13:50		267468	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Chloroethane	5.0	U	5.0	0.31	1	NA	10/31/11 13:50		267468	
Chloroform	5.0	U	5.0	0.22	1	NA	10/31/11 13:50		267468	
Chloromethane	5.0	U	5.0	0.24	1	NA	10/31/11 13:50		267468	
Cyclohexane	10	U	10	0.24	1	NA	10/31/11 13:50		267468	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	10/31/11 13:50		267468	
Dichloromethane	5.0	U	5.0	0.22	1	NA	10/31/11 13:50		267468	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Methyl Acetate	10	U	10	0.23	1	NA	10/31/11 13:50		267468	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111185-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Methylcyclohexane	10	U	10	0.25	1	NA	10/31/11 13:50		267468	
Styrene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Toluene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	10/31/11 13:50		267468	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	10/31/11 13:50		267468	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	10/31/11 13:50		267468	
o-Xylene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	10/31/11 13:50		267468	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	10/31/11 13:50	
Dibromofluoromethane	102	89-119	10/31/11 13:50	
Toluene-d8	102	87-121	10/31/11 13:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1111072-01

Service Request: R1106024
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	11/1/11 16:56		267722	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	11/1/11 16:56		267722	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	11/1/11 16:56		267722	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	11/1/11 16:56		267722	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	11/1/11 16:56		267722	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	11/1/11 16:56		267722	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	11/1/11 16:56		267722	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
n-Butanol	250	U	250	11	1	NA	11/1/11 16:56		267722	
2-Butanone (MEK)	10	U	10	0.51	1	NA	11/1/11 16:56		267722	
2-Hexanone	10	U	10	0.35	1	NA	11/1/11 16:56		267722	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	11/1/11 16:56		267722	
Acetone	20	U	20	0.98	1	NA	11/1/11 16:56		267722	
Benzene	5.0	U	5.0	0.21	1	NA	11/1/11 16:56		267722	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Bromoform	5.0	U	5.0	0.27	1	NA	11/1/11 16:56		267722	
Bromomethane	5.0	U	5.0	0.31	1	NA	11/1/11 16:56		267722	
Carbon Disulfide	10	U	10	0.20	1	NA	11/1/11 16:56		267722	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	11/1/11 16:56		267722	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Chloroethane	5.0	U	5.0	0.31	1	NA	11/1/11 16:56		267722	
Chloroform	5.0	U	5.0	0.22	1	NA	11/1/11 16:56		267722	
Chloromethane	5.0	U	5.0	0.24	1	NA	11/1/11 16:56		267722	
Cyclohexane	10	U	10	0.24	1	NA	11/1/11 16:56		267722	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	11/1/11 16:56		267722	
Dichloromethane	5.0	U	5.0	0.22	1	NA	11/1/11 16:56		267722	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Methyl Acetate	10	U	10	0.23	1	NA	11/1/11 16:56		267722	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111072-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Methylcyclohexane	10	U	10	0.25	1	NA	11/1/11 16:56		267722	
Styrene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Toluene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	11/1/11 16:56		267722	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	11/1/11 16:56		267722	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	11/1/11 16:56		267722	
o-Xylene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/1/11 16:56		267722	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	11/1/11 16:56	
Dibromofluoromethane	102	89-119	11/1/11 16:56	
Toluene-d8	103	87-121	11/1/11 16:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111238-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	11/2/11 11:57		267849	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	11/2/11 11:57		267849	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	11/2/11 11:57		267849	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	11/2/11 11:57		267849	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	11/2/11 11:57		267849	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	11/2/11 11:57		267849	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	11/2/11 11:57		267849	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
n-Butanol	250	U	250	11	1	NA	11/2/11 11:57		267849	
2-Butanone (MEK)	10	U	10	0.51	1	NA	11/2/11 11:57		267849	
2-Hexanone	10	U	10	0.35	1	NA	11/2/11 11:57		267849	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	11/2/11 11:57		267849	
Acetone	20	U	20	0.98	1	NA	11/2/11 11:57		267849	
Benzene	5.0	U	5.0	0.21	1	NA	11/2/11 11:57		267849	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Bromoform	5.0	U	5.0	0.27	1	NA	11/2/11 11:57		267849	
Bromomethane	5.0	U	5.0	0.31	1	NA	11/2/11 11:57		267849	
Carbon Disulfide	10	U	10	0.20	1	NA	11/2/11 11:57		267849	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	11/2/11 11:57		267849	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Chloroethane	5.0	U	5.0	0.31	1	NA	11/2/11 11:57		267849	
Chloroform	5.0	U	5.0	0.22	1	NA	11/2/11 11:57		267849	
Chloromethane	5.0	U	5.0	0.24	1	NA	11/2/11 11:57		267849	
Cyclohexane	10	U	10	0.24	1	NA	11/2/11 11:57		267849	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	11/2/11 11:57		267849	
Dichloromethane	5.0	U	5.0	0.22	1	NA	11/2/11 11:57		267849	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Methyl Acetate	10	U	10	0.23	1	NA	11/2/11 11:57		267849	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111238-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Methylcyclohexane	10	U	10	0.25	1	NA	11/2/11 11:57		267849	
Styrene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Toluene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	11/2/11 11:57		267849	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	11/2/11 11:57		267849	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	11/2/11 11:57		267849	
o-Xylene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/2/11 11:57		267849	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	11/2/11 11:57	
Dibromofluoromethane	102	89-119	11/2/11 11:57	
Toluene-d8	105	87-121	11/2/11 11:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111161-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/3/11 13:53		268117	
Ethene	1.0	U	1.0	1	NA	11/3/11 13:53		268117	
Methane	2.0	U	2.0	1	NA	11/3/11 13:53		268117	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111222-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/4/11 09:46		268312	
Ethene	1.0	U	1.0	1	NA	11/4/11 09:46		268312	
Methane	2.0	U	2.0	1	NA	11/4/11 09:46		268312	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111302-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	1.0	U	1.0	1	NA	11/7/11 09:14		268430	
Ethene	1.0	U	1.0	1	NA	11/7/11 09:14		268430	
Methane	2.0	U	2.0	1	NA	11/7/11 09:14		268430	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111303-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/7/11 14:06		268433	
Ethene	1.0	U	1.0	1	NA	11/7/11 14:06		268433	
Methane	2.0	U	2.0	1	NA	11/7/11 14:06		268433	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111335-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/8/11 12:42		268565	
Ethene	1.0	U	1.0	1	NA	11/8/11 12:42		268565	
Methane	2.0	U	2.0	1	NA	11/8/11 12:42		268565	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111426-01

Service Request: R1106024
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.0	U	1.0	1	NA	11/9/11 08:24		268842	
Ethene	1.0	U	1.0	1	NA	11/9/11 08:24		268842	
Methane	2.0	U	2.0	1	NA	11/9/11 08:24		268842	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: NA
Date Received: NA
Date Analyzed: 11/7/11 12:25

Sample Name: Method Blank
Lab Code: RQ1111307-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\110711\X0006651.D\

Analysis Lot: 268467
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: NA
Date Received: NA
Date Analyzed: 11/9/11 14:05

Sample Name: Method Blank
Lab Code: RQ1111427-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\110911\X0006698.D\

Analysis Lot: 268843
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: NA
Date Received: NA
Date Analyzed: 11/11/11 14:57

Sample Name: Method Blank
Lab Code: RQ1111632-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111111\X0006746.D\

Analysis Lot: 269418
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: NA
Date Received: NA
Date Analyzed: 11/14/11 13:57

Sample Name: Method Blank
Lab Code: RQ1111655-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\111411\X0006778.D\

Analysis Lot: 269468
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/26/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001D-045.5-20111025
Lab Code: R1106024-009

Units: mg/L
Basis: NA

Analytical Method: 300.0

Analyte Name	Sample Result	LC34-BW0001D-045.5-201110 25MS Matrix Spike R1106024-009MS2			LC34-BW0001D-045.5-201110 25DMS Duplicate Matrix Spike R1106024-009DMS2			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Bromide	12.7	22.5	10.0	98	22.4	10.0	96	90 - 110	<1	20
Nitrate as Nitrogen	ND	9.8	10.0	98	9.7	10.0	97	90 - 110	<1	20
Sulfate	69.0	86.3	20.0	86 *	85.8	20.0	84 *	90 - 110	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/27/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Units: mg/L
Basis: NA

LC34-BW0001F-059.
 5-20111025DUP
Duplicate Sample

Analyte Name	Method	MRL	Sample Result	Duplicate Sample		RPD	RPD Limit
				Result	Average		
Iodide	300.0	2.0	2.0 U	2.0 U	NC	NC	20

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/27/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001F-059.5-20111025
Lab Code: R1106024-013

Units: mg/L
Basis: NA

Analytical Method: 300.0

LC34-BW0001F-059.5-201110
 25MS
Matrix Spike
 R1106024-013MS3

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Iodide	ND	9.1	10.0	91	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 11/ 8/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Units: mg/L
Basis: NA

LC34-BW0002C-038.
 5-20111026DUP

Duplicate Sample
 R1106024-027DUP2

Analyte Name	Method	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	366	360	363	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 11/ 8/11

Matrix Spike Summary
General Chemistry Parameters

Sample Name: LC34-BW0002C-038.5-20111026
Lab Code: R1106024-027

Units: mg/L
Basis: NA

Analytical Method: SM 2320 B

LC34-BW0002C-038.5-201110
26MS

Matrix Spike
R1106024-027MS4

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO ₃ , Total	366	500	143	94	70 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/27/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Units: mg/L
Basis: NA

Analyte Name	Method	MRL	Sample Result	LC34-IW0002I-027.5 -20111026DUP Duplicate Sample R1106024-038DUP4		Average	RPD	RPD Limit
				Result	Result			
Bromide	300.0	1.0	2.7	2.6	2.65	3	20	
Chloride	300.0	2.0	65.4	65.6	65.5	<1	20	
Iodide	300.0	2.0	2.5	2.5	2.50	<1	20	
Nitrate as Nitrogen	300.0	1.0	1.0 U	1.0 U	NC	NC	20	
Sulfate	300.0	2.0	30.9	30.7	30.8	<1	20	
Nitrite as Nitrogen	300.0	1.0	1.0 U	1.0 U	NC	NC	20	

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/27/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002I-027.5-20111026
Lab Code: R1106024-038

Units: mg/L
Basis: NA

Analytical Method: 300.0

LC34-IW0002I-027.5-2011102

6MS

Matrix Spike
 R1106024-038MS6

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	2.7	13.2	10.0	105	90 - 110
Chloride	65.4	83.0	20.0	88 *	90 - 110
Iodide	2.5	11.3	10.0	88 *	90 - 110
Nitrate as Nitrogen	ND	10.2	10.0	102	90 - 110
Nitrite as Nitrogen	ND	9.9	10	99	90 - 110
Sulfate	30.9	49.6	20.0	94	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/29/11

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Units: mg/L
Basis: NA

LC34-IW0002D-037.
 5-20111026DUP

Duplicate Sample
 R1106024-040DUP5

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Carbon, Total Organic (TOC), Average	9060A	100	590	590	591	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/29/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002D-037.5-20111026
Lab Code: R1106024-040

Units: mg/L
Basis: NA

Analytical Method: 9060A

LC34-IW0002D-037.5-2011102
 6MS
Matrix Spike
 R1106024-040MS7

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	590	1560	1000	97	62 - 135

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/11/11

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0003B-031.5-20111027
Lab Code: R1106024-044

Units: mg/L
Basis: NA

Analytical Method: 300.0

Analyte Name	Sample Result	LC34-BW0003B-031.5-201110 27MS Matrix Spike R1106024-044MS8			LC34-BW0003B-031.5-201110 27DMS Duplicate Matrix Spike R1106024-044DMS8			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Iodide	ND	9.2	10.0	92	9.5	10.0	95	90 - 110	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Collected: 10/26/11
 Date Received: 10/27/11
 Date Analyzed: 11/4/11

Replicate Sample Summary
 Inorganic Parameters

Sample Name: LC34-IW0002D1-052.5-20111026 Dissolved
 Lab Code: R1106024-043

Units: µg/L
 Basis: NA

LC34-IW0002D1-052
 .5-20111026
 DissolvedDUP

Duplicate Sample

R1106024-043DUP

Analyte Name	Method	MRL	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Arsenic, Dissolved	6010C	10	10 U	10 U	NC	NC	20
Iron, Dissolved	6010C	100	100 U	100 U	NC	NC	20
Manganese, Dissolved	6010C	10	13	13	13.3	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 11/4/11

**Matrix Spike Summary
 Inorganic Parameters**

Sample Name: LC34-IW0002D1-052.5-20111026 Dissolver
Lab Code: R1106024-043

Units: µg/L
Basis: NA

Analytical Method: 6010C
Prep Method: EPA 3010A

LC34-IW0002D1-052.5-201110
 26 DissolvedMS
Matrix Spike
 R1106024-043MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	ND	40	40	99	75 - 125
Iron, Dissolved	ND	1030	1000	103	75 - 125
Manganese, Dissolved	13	528	500	103	75 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/31/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-BW0001B-031.5-201110 25MS Matrix Spike RQ1111185-05			LC34-BW0001B-031.5-201110 25DMS Duplicate Matrix Spike RQ1111185-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	50000	50000	100	46200	50000	92	76 - 142	8	30
1,1,2,2-Tetrachloroethane	ND	46700	50000	93	45300	50000	91	71 - 120	3	30
1,1,2-Trichloroethane	ND	50500	50000	101	48700	50000	97	80 - 119	3	30
1,1,2-Trichloro-1,2,2-trifluoroethane	68000	120000	50000	105	103000	50000	72	65 - 154	15	30
1,1-Dichloroethane (1,1-DCA)	ND	51000	50000	102	47600	50000	95	79 - 134	7	30
1,1-Dichloroethene (1,1-DCE)	ND	47000	50000	94	43300	50000	87	71 - 143	8	30
1,2,4-Trichlorobenzene	ND	47400	50000	95	46400	50000	93	75 - 118	2	30
1,2-Dibromo-3-chloropropane (DBC)	ND	57400	50000	115	57900	50000	116	60 - 125	<1	30
1,2-Dibromoethane	ND	53000	50000	106	51500	50000	103	78 - 119	3	30
1,2-Dichlorobenzene	ND	50000	50000	100	48300	50000	97	82 - 117	4	30
1,2-Dichloroethane	ND	52800	50000	106	51300	50000	103	73 - 133	3	30
1,2-Dichloropropane	ND	50700	50000	101	49700	50000	99	84 - 124	2	30
1,3-Dichlorobenzene	ND	51100	50000	102	49100	50000	98	82 - 117	4	30
1,4-Dichlorobenzene	ND	50000	50000	100	48300	50000	97	81 - 116	3	30
n-Butanol	1400000	3340000	2510000	77	3880000	2510000	98	50 - 150	15	30
2-Butanone (MEK)	ND	48800	50000	98	46800	50000	94	54 - 130	4	30
2-Hexanone	ND	55300	50000	111	57300	50000	115	55 - 125	4	30
4-Methyl-2-pentanone	ND	53900	50000	108	53900	50000	108	59 - 131	<1	30
Acetone	ND	55200	50000	110	44900	50000	90	37 - 152	21	30
Benzene	ND	48900	50000	98	46400	50000	93	81 - 124	5	30
Bromodichloromethane	ND	55100	50000	110	53400	50000	107	81 - 126	3	30
Bromoform	ND	59500	50000	119	58600	50000	117	61 - 126	2	30
Bromomethane	ND	23100	50000	46	28600	50000	57	45 - 154	21	30
Carbon Disulfide	ND	53700	50000	107	50400	50000	101	32 - 149	6	30
Carbon Tetrachloride	ND	55800	50000	112	52300	50000	105	71 - 146	7	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/31/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	LC34-BW0001B-031.5-201110 25MS Matrix Spike RQ1111185-05				LC34-BW0001B-031.5-201110 25DMS Duplicate Matrix Spike RQ1111185-06				% Rec Limits	RPD	RPD Limit
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec				
Chlorobenzene	ND	51200	50000	102	48700	50000	97	80 - 125	5	30	
Chloroethane	ND	47500	50000	95	43600	50000	87	68 - 148	9	30	
Chloroform	ND	51100	50000	102	47700	50000	95	81 - 131	7	30	
Chloromethane	ND	40100	50000	80	36900	50000	74	61 - 151	8	30	
Cyclohexane	ND	50000	50000	100	49600	50000	99	59 - 144	<1	30	
Dibromochloromethane	ND	57300	50000	115	55600	50000	111	74 - 130	3	30	
Dichlorodifluoromethane (CFC 12)	ND	44100	50000	88	40300	50000	81	44 - 175	9	30	
Dichloromethane	ND	48100	50000	96	45600	50000	91	78 - 125	5	30	
Ethylbenzene	ND	52800	50000	106	49400	50000	99	84 - 127	7	30	
Isopropylbenzene (Cumene)	ND	58000	50000	116	54300	50000	109	82 - 140	7	30	
Methyl Acetate	ND	49100	50000	98	49400	50000	99	38 - 156	<1	30	
Methyl tert-Butyl Ether	ND	48600	50000	97	47200	50000	94	75 - 126	3	30	
Methylcyclohexane	ND	48400	50000	97	48600	50000	97	63 - 141	<1	30	
Styrene	ND	55700	50000	111	52500	50000	105	43 - 146	6	30	
Tetrachloroethene (PCE)	ND	51500	50000	103	48600	50000	97	66 - 142	6	30	
Toluene	ND	50500	50000	101	47500	50000	95	81 - 125	6	30	
Trichloroethene (TCE)	3200	56500	50000	107	53700	50000	101	71 - 133	5	30	
Trichlorofluoromethane (CFC 11)	ND	49200	50000	98	44900	50000	90	71 - 159	9	30	
Vinyl Chloride	1100	48000	50000	94	44500	50000	87	72 - 154	8	30	
cis-1,2-Dichloroethene	12000	60400	50000	98	56000	50000	89	72 - 137	8	30	
cis-1,3-Dichloropropene	ND	50600	50000	101	48900	50000	98	71 - 120	4	30	
m,p-Xylenes	ND	106000	100000	106	98800	100000	99	80 - 129	7	30	
n-Butyl Acetate	56000	107000	50000	103	104000	50000	95	18 - 159	4	30	
o-Xylene	ND	52600	50000	105	49600	50000	99	80 - 126	6	30	
trans-1,2-Dichloroethene	260	48800	50000	97	45100	50000	90	77 - 130	8	30	

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 10/31/11

**Matrix Spike Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Sample Name: LC34-BW0001B-031.5-20111025
Lab Code: R1106024-005

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-BW0001B-031.5-201110 25MS Matrix Spike RQ1111185-05			LC34-BW0001B-031.5-201110 25DMS Duplicate Matrix Spike RQ1111185-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
trans-1,3-Dichloropropene	ND	51000	50000	102	50400	50000	101	67 - 122	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/29/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-RW0008-052.0-20111026 LC34-RW0008-052.0-20111026

Analyte Name	Sample Result	MS Matrix Spike RQ1111029-05			DMS Duplicate Matrix Spike RQ1111029-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	472	500	94	532	500	106	76 - 142	12	30
1,1,2,2-Tetrachloroethane	ND	467	500	93	510	500	102	71 - 120	9	30
1,1,2-Trichloroethane	ND	501	500	100	535	500	107	80 - 119	6	30
1,1,2-Trichloro-1,2,2-trifluoroethane	1200	1490	500	54 *	1540	500	63 *	65 - 154	3	30
1,1-Dichloroethane (1,1-DCA)	ND	490	500	98	543	500	109	79 - 134	10	30
1,1-Dichloroethene (1,1-DCE)	ND	456	500	91	515	500	103	71 - 143	12	30
1,2,4-Trichlorobenzene	ND	431	500	86	469	500	94	75 - 118	8	30
1,2-Dibromo-3-chloropropane (DBC)	ND	543	500	109	576	500	115	60 - 125	6	30
1,2-Dibromoethane	ND	502	500	100	528	500	106	78 - 119	5	30
1,2-Dichlorobenzene	ND	455	500	91	499	500	100	82 - 117	9	30
1,2-Dichloroethane	ND	512	500	102	547	500	109	73 - 133	7	30
1,2-Dichloropropane	ND	496	500	99	541	500	108	84 - 124	9	30
1,3-Dichlorobenzene	ND	455	500	91	509	500	102	82 - 117	11	30
1,4-Dichlorobenzene	ND	449	500	90	494	500	99	81 - 116	9	30
n-Butanol	ND	28500	25100	114	31500	25100	125	50 - 150	10	30
2-Butanone (MEK)	ND	495	500	99	499	500	100	54 - 130	<1	30
2-Hexanone	ND	523	500	105	536	500	107	55 - 125	3	30
4-Methyl-2-pentanone	ND	554	500	111	562	500	112	59 - 131	1	30
Acetone	ND	508	500	102	666	500	133	37 - 152	27	30
Benzene	ND	462	500	92	512	500	102	81 - 124	10	30
Bromodichloromethane	ND	524	500	105	574	500	115	81 - 126	9	30
Bromoform	ND	551	500	110	594	500	119	61 - 126	7	30
Bromomethane	ND	290	500	58	345	500	69	45 - 154	17	30
Carbon Disulfide	ND	541	500	108	571	500	114	32 - 149	5	30
Carbon Tetrachloride	ND	510	500	102	578	500	116	71 - 146	12	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Collected: 10/26/11
 Date Received: 10/27/11
 Date Analyzed: 10/29/11

Matrix Spike Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-RW0008-052.0-20111026
 Lab Code: R1106024-036

Units: µg/L
 Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-RW0008-052.0-20111026 MS			LC34-RW0008-052.0-20111026 DMS			% Rec Limits	RPD	RPD Limit
		Matrix Spike RQ1111029-05			Duplicate Matrix Spike RQ1111029-06					
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chlorobenzene	ND	464	500	93	508	500	102	80 - 125	9	30
Chloroethane	ND	472	500	94	520	500	104	68 - 148	10	30
Chloroform	ND	491	500	98	541	500	108	81 - 131	10	30
Chloromethane	ND	419	500	84	449	500	90	61 - 151	7	30
Cyclohexane	ND	497	500	99	494	500	99	59 - 144	<1	30
Dibromochloromethane	ND	526	500	105	576	500	115	74 - 130	9	30
Dichlorodifluoromethane (CFC 12)	ND	433	500	87	481	500	96	44 - 175	10	30
Dichloromethane	ND	469	500	94	511	500	102	78 - 125	9	30
Ethylbenzene	ND	474	500	95	525	500	105	84 - 127	10	30
Isopropylbenzene (Cumene)	ND	510	500	102	570	500	114	82 - 140	11	30
Methyl Acetate	ND	721	500	144	749	500	150	38 - 156	4	30
Methyl tert-Butyl Ether	ND	493	500	99	532	500	106	75 - 126	8	30
Methylcyclohexane	ND	478	500	96	466	500	93	63 - 141	3	30
Styrene	ND	487	500	97	543	500	109	43 - 146	11	30
Tetrachloroethene (PCE)	ND	453	500	91	501	500	100	66 - 142	10	30
Toluene	ND	476	500	95	525	500	105	81 - 125	10	30
Trichloroethene (TCE)	1900	2150	500	55 *	2210	500	68 *	71 - 133	3	30
Trichlorofluoromethane (CFC 11)	ND	492	500	98	543	500	109	71 - 159	10	30
Vinyl Chloride	630	1010	500	77	1080	500	91	72 - 154	7	30
cis-1,2-Dichloroethene	1700	2020	500	57 *	2120	500	75	72 - 137	4	30
cis-1,3-Dichloropropene	ND	402	500	80	433	500	87	71 - 120	7	30
m,p-Xylenes	ND	940	1000	94	1040	1000	104	80 - 129	10	30
n-Butyl Acetate	ND	202	500	40	216	500	43	18 - 159	7	30
o-Xylene	ND	472	500	94	523	500	105	80 - 126	10	30
trans-1,2-Dichloroethene	12	482	500	94	528	500	103	77 - 130	9	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 10/29/11

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-RW0008-052.0-20111026
Lab Code: R1106024-036

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-RW0008-052.0-20111026 MS
LC34-RW0008-052.0-20111026 DMS
Matrix Spike Duplicate Matrix Spike
RQ1111029-05 RQ1111029-06

Analyte Name	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
trans-1,3-Dichloropropene	ND	449	500	90	487	500	97	67 - 122	8	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 11/ 4/11

**Matrix Spike Summary
Dissolved Gases by GC/FID**

Sample Name: LC34-BW0001C-038.5-20111025
Lab Code: R1106024-007

Units: µg/L
Basis: NA

Analytical Method: RSK 175

Analyte Name	LC34-BW0001C-038.5-201110 25MS Matrix Spike RQ1111222-03				LC34-BW0001C-038.5-201110 25DMS Duplicate Matrix Spike RQ1111222-04			% Rec Limits	RPD	RPD Limit
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	57	106	52.1	95	111	52.1	104	57 - 133	4	30
Ethene	10	56.2	48.6	95	60.1	48.6	103	58 - 135	7	30
Methane	64	114	52.4	97	116	52.4	99	47 - 146	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/ 9/11

**Matrix Spike Summary
Dissolved Gases by GC/FID**

Sample Name: LC34-BW0003E-052.5-20111027
Lab Code: R1106024-046

Units: µg/L
Basis: NA

Analytical Method: RSK 175

Analyte Name	Sample Result	LC34-BW0003E-052.5-201110 27MS Matrix Spike RQ1111426-03			LC34-BW0003E-052.5-201110 27DMS Duplicate Matrix Spike RQ1111426-04			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	ND	3090	2610	118	3250	2610	125	57 - 133	5	30
Ethene	4.1	2660	2430	109	2820	2430	116	58 - 135	6	30
Methane	2000	5270	2620	124	5330	2620	126	47 - 146	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/25/11
Date Received: 10/26/11
Date Analyzed: 11/ 8/11

Matrix Spike Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-IW0076-075.0-20111025
Lab Code: R1106024-001

Units: mg/L
Basis: NA

Analytical Method: Organic Acids

Analyte Name	LC34-IW0076-075.0-20111025 MS Matrix Spike RQ1111307-04				LC34-IW0076-075.0-20111025 DMS Duplicate Matrix Spike RQ1111307-05			% Rec Limits	RPD	RPD Limit
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	1.05	1.00	105	1.06	1.00	106	25 - 152	<1	30
Acetic Acid	12	20.2	10.0	81	20.3	10.0	81	13 - 167	<1	30
Butanoic Acid (Butyric Acid)	13	21.3	10.0	86	23.9	10.0	113	49 - 145	12	30
Lactic Acid	ND	9.25	9.97	93	9.33	9.97	94	27 - 127	<1	30
Propionic Acid	ND	8.55	9.97	86	8.33	9.97	84	68 - 133	3	30

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/26/11
Date Received: 10/27/11
Date Analyzed: 11/12/11

Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-RW0007-038.5-20111026
Lab Code: R1106024-034

Units: mg/L
Basis: NA

Analytical Method: Organic Acids

LC34-RW0007-038.5-20111026 LC34-RW0007-038.5-20111026

MS
Matrix Spike
 RQ1111632-04
 DMS
Duplicate Matrix Spike
 RQ1111632-05

Analyte Name	Sample Result	MS Matrix Spike RQ1111632-04			DMS Duplicate Matrix Spike RQ1111632-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	5.40	5.00	108	5.30	5.00	106	25 - 152	2	30
Acetic Acid	270	319	50.0	91 #	319	50.0	91 #	13 - 167	<1	30
Butanoic Acid (Butyric Acid)	270	314	50.0	90 #	313	50.0	87 #	49 - 145	<1	30
Lactic Acid	ND	47.4	49.9	95	45.8	49.9	92	27 - 127	3	30
Propionic Acid	17	61.5	49.8	90	59.5	49.8	86	68 - 133	3	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Collected: 10/27/11
Date Received: 10/28/11
Date Analyzed: 11/15/11

Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-BW0003C-038.5-20111027 **Units:** mg/L
Lab Code: R1106024-045 **Basis:** NA

Analytical Method: Organic Acids

Analyte Name	Sample Result	LC34-BW0003C-038.5-201110 27MS Matrix Spike RQ1111655-04			LC34-BW0003C-038.5-201110 27DMS Duplicate Matrix Spike RQ1111655-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	1.12	1.00	112	1.14	1.00	114	25 - 152	2	30
Acetic Acid	25	32.6	10.0	80	32.6	10.0	80	13 - 167	<1	30
Butanoic Acid (Butyric Acid)	ND	10.9	10.0	109	10.6	10.0	106	49 - 145	3	30
Lactic Acid	ND	9.12	9.97	91	9.28	9.97	93	27 - 127	2	30
Propionic Acid	ND	8.76	9.97	88	8.76	9.97	88	68 - 133	<1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 1/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS1			Duplicate Lab Control Sample R1106024-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.74	5.6	103	5.64	5.6	101	56 - 138	2	20

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/26/11 -
 11/ 8/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.981	1.00	98	90 - 110
Chloride	300.0	2.11	2.00	106	90 - 110
Iodide	300.0	0.940	1.00	94	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110
Sulfate	300.0	1.98	2.00	99	90 - 110
Sulfide, Total	SM 4500-S2- F	6.22	6.4	98	56 - 138
Alkalinity as CaCO3, Total	SM 2320 B	19.0	20.0	95	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.96	10.0	100	86 - 117
Nitrite as Nitrogen	300.0	1.02	1.0	103	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/26/11 -
 11/ 8/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.970	1.00	97	90 - 110
Chloride	300.0	2.01	2.00	101	90 - 110
Iodide	300.0	0.927	1.00	93	90 - 110
Nitrate as Nitrogen	300.0	1.02	1.00	102	90 - 110
Sulfate	300.0	1.95	2.00	97	90 - 110
Sulfide, Total	SM 4500-S2- F	6.37	6.4	100	56 - 138
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.8	20.0	104	72 - 115
Carbon, Total Organic (TOC), Average	9060A	10.3	10.0	103	86 - 117
Nitrite as Nitrogen	300.0	1.00	1.0	100	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/27/11 - 11/11/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS4			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Chloride	300.0	2.01	2.00	101	90 - 110
Iodide	300.0	0.895	1.00	90	90 - 110
Nitrate as Nitrogen	300.0	1.01	1.00	101	90 - 110
Sulfate	300.0	2.03	2.00	101	90 - 110
Carbon, Total Organic (TOC), Average	9060A	10.2	10.0	102	86 - 117
Nitrite as Nitrogen	300.0	1.00	1.0	100	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/28/11 -
 11/ 4/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS5			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.08	1.00	108	90 - 110
Chloride	300.0	2.03	2.00	101	90 - 110
Nitrate as Nitrogen	300.0	0.988	1.00	99	90 - 110
Sulfate	300.0	1.95	2.00	98	90 - 110
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117
Nitrite as Nitrogen	300.0	1.00	1.0	101	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/28/11 -
11/ 4/11

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS6			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.03	1.00	103	90 - 110
Nitrate as Nitrogen	300.0	1.01	1.00	101	90 - 110
Sulfate	300.0	2.01	2.00	100	90 - 110
Carbon, Total Organic (TOC), Average	9060A	10.2	10.0	102	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 8/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R1106024-LCS7

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	1.04	1.00	104	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 8/11

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106024-LCS8			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.06	1.00	106	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 4/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Lab Control Sample
 R1106024-LCS1

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	38.2	40	95	80 - 120
Iron, Dissolved	6010C	1000	1000	100	80 - 120
Manganese, Dissolved	6010C	494	500	99	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/11/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1106024-LCS2

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	36.6	40	91	80 - 120
Iron, Dissolved	6010C	986	1000	99	80 - 120
Manganese, Dissolved	6010C	479	500	96	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267265

**Lab Control Sample
 RQ1110942-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.8	20.0	84	72 - 128
1,1,2,2-Tetrachloroethane	19.1	20.0	96	72 - 131
1,1,2-Trichloroethane	19.1	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.2	20.0	76	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.0	20.0	90	76 - 124
1,1-Dichloroethene (1,1-DCE)	15.7	20.0	79	72 - 129
1,2,4-Trichlorobenzene	18.3	20.0	92	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.3	20.0	92	62 - 131
1,2-Dibromoethane	19.1	20.0	95	78 - 125
1,2-Dichlorobenzene	18.3	20.0	92	79 - 124
1,2-Dichloroethane	19.7	20.0	99	73 - 127
1,2-Dichloropropane	18.7	20.0	94	80 - 123
1,3-Dichlorobenzene	18.2	20.0	91	78 - 124
1,4-Dichlorobenzene	18.4	20.0	92	78 - 123
n-Butanol	963	1000	96	70 - 130
2-Butanone (MEK)	18.4	20.0	92	60 - 133
2-Hexanone	19.7	20.0	99	61 - 131
4-Methyl-2-pentanone	19.9	20.0	100	61 - 132
Acetone	16.9	20.0	85	54 - 139
Benzene	17.3	20.0	86	78 - 121
Bromodichloromethane	19.2	20.0	96	80 - 125
Bromoform	21.8	20.0	109	68 - 130
Bromomethane	13.5	20.0	67	57 - 144
Carbon Disulfide	16.6	20.0	83	52 - 140
Carbon Tetrachloride	17.5	20.0	87	68 - 133
Chlorobenzene	18.1	20.0	91	80 - 121
Chloroethane	17.1	20.0	85	71 - 130
Chloroform	18.1	20.0	90	78 - 125
Chloromethane	15.9	20.0	79	61 - 138
Cyclohexane	18.0	20.0	90	57 - 126
Dibromochloromethane	20.7	20.0	104	78 - 133
Dichlorodifluoromethane (CFC 12)	14.5	20.0	73	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/28/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267265

**Lab Control Sample
 RQ1110942-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.5	20.0	88	75 - 125
Ethylbenzene	17.8	20.0	89	78 - 123
Isopropylbenzene (Cumene)	19.2	20.0	96	73 - 133
Methyl Acetate	17.9	20.0	90	57 - 157
Methyl tert-Butyl Ether	18.4	20.0	92	75 - 126
Methylcyclohexane	18.4	20.0	92	61 - 125
Styrene	18.7	20.0	94	80 - 132
Tetrachloroethene (PCE)	17.2	20.0	86	72 - 131
Toluene	17.6	20.0	88	78 - 122
Trichloroethene (TCE)	17.6	20.0	88	74 - 127
Trichlorofluoromethane (CFC 11)	16.3	20.0	81	69 - 141
Vinyl Chloride	16.6	20.0	83	72 - 138
cis-1,2-Dichloroethene	18.3	20.0	92	78 - 122
cis-1,3-Dichloropropene	18.9	20.0	94	77 - 125
m,p-Xylenes	35.2	40.0	88	79 - 126
n-Butyl Acetate	19.8	20.0	99	31 - 144
o-Xylene	18.1	20.0	91	77 - 118
trans-1,2-Dichloroethene	17.0	20.0	85	75 - 121
trans-1,3-Dichloropropene	19.2	20.0	96	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Analyzed: 10/29/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 267270

Lab Control Sample
 RQ1111029-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.3	20.0	101	72 - 128
1,1,2,2-Tetrachloroethane	16.8	20.0	84	72 - 131
1,1,2-Trichloroethane	21.1	20.0	105	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.9	20.0	94	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.9	20.0	104	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.7	20.0	99	72 - 129
1,2,4-Trichlorobenzene	19.9	20.0	100	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.1	20.0	106	62 - 131
1,2-Dibromoethane	21.1	20.0	105	78 - 125
1,2-Dichlorobenzene	20.0	20.0	100	79 - 124
1,2-Dichloroethane	21.6	20.0	108	73 - 127
1,2-Dichloropropane	20.7	20.0	104	80 - 123
1,3-Dichlorobenzene	20.1	20.0	101	78 - 124
1,4-Dichlorobenzene	19.9	20.0	99	78 - 123
n-Butanol	1520	1000	151 *	70 - 130
2-Butanone (MEK)	20.1	20.0	101	60 - 133
2-Hexanone	22.1	20.0	110	61 - 131
4-Methyl-2-pentanone	22.1	20.0	111	61 - 132
Acetone	18.7	20.0	94	54 - 139
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	21.3	20.0	106	80 - 125
Bromoform	23.5	20.0	117	68 - 130
Bromomethane	15.2	20.0	76	57 - 144
Carbon Disulfide	22.0	20.0	110	52 - 140
Carbon Tetrachloride	22.1	20.0	111	68 - 133
Chlorobenzene	20.2	20.0	101	80 - 121
Chloroethane	20.2	20.0	101	71 - 130
Chloroform	20.5	20.0	102	78 - 125
Chloromethane	18.7	20.0	94	61 - 138
Cyclohexane	18.4	20.0	92	57 - 126
Dibromochloromethane	22.4	20.0	112	78 - 133
Dichlorodifluoromethane (CFC 12)	18.8	20.0	94	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Analyzed: 10/29/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 267270

Lab Control Sample
 RQ1111029-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.8	20.0	99	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	22.2	20.0	111	73 - 133
Methyl Acetate	20.1	20.0	101	57 - 157
Methyl tert-Butyl Ether	20.9	20.0	105	75 - 126
Methylcyclohexane	17.9	20.0	89	61 - 125
Styrene	20.6	20.0	103	80 - 132
Tetrachloroethene (PCE)	20.1	20.0	100	72 - 131
Toluene	20.5	20.0	102	78 - 122
Trichloroethene (TCE)	24.1	20.0	120	74 - 127
Trichlorofluoromethane (CFC 11)	20.6	20.0	103	69 - 141
Vinyl Chloride	20.2	20.0	101	72 - 138
cis-1,2-Dichloroethene	21.0	20.0	105	78 - 122
cis-1,3-Dichloropropene	20.6	20.0	103	77 - 125
m,p-Xylenes	40.3	40.0	101	79 - 126
n-Butyl Acetate	22.2	20.0	111	31 - 144
o-Xylene	20.0	20.0	100	77 - 118
trans-1,2-Dichloroethene	20.2	20.0	101	75 - 121
trans-1,3-Dichloropropene	20.3	20.0	102	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/30/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 267361

**Lab Control Sample
 RQ1111182-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.5	20.0	97	72 - 128
1,1,2,2-Tetrachloroethane	18.7	20.0	93	72 - 131
1,1,2-Trichloroethane	19.9	20.0	99	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.6	20.0	93	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.3	20.0	101	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.5	20.0	93	72 - 129
1,2,4-Trichlorobenzene	19.6	20.0	98	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.6	20.0	93	62 - 131
1,2-Dibromoethane	19.5	20.0	97	78 - 125
1,2-Dichlorobenzene	19.3	20.0	97	79 - 124
1,2-Dichloroethane	20.8	20.0	104	73 - 127
1,2-Dichloropropane	20.2	20.0	101	80 - 123
1,3-Dichlorobenzene	19.7	20.0	99	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
n-Butanol	1160	1000	116	70 - 130
2-Butanone (MEK)	19.5	20.0	98	60 - 133
2-Hexanone	21.0	20.0	105	61 - 131
4-Methyl-2-pentanone	20.9	20.0	105	61 - 132
Acetone	20.1	20.0	100	54 - 139
Benzene	19.5	20.0	97	78 - 121
Bromodichloromethane	20.8	20.0	104	80 - 125
Bromoform	22.0	20.0	110	68 - 130
Bromomethane	15.3	20.0	77	57 - 144
Carbon Disulfide	21.0	20.0	105	52 - 140
Carbon Tetrachloride	20.7	20.0	104	68 - 133
Chlorobenzene	19.6	20.0	98	80 - 121
Chloroethane	19.8	20.0	99	71 - 130
Chloroform	20.4	20.0	102	78 - 125
Chloromethane	18.3	20.0	92	61 - 138
Cyclohexane	20.3	20.0	101	57 - 126
Dibromochloromethane	21.4	20.0	107	78 - 133
Dichlorodifluoromethane (CFC 12)	17.6	20.0	88	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/30/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 267361

Lab Control Sample RQ1111182-02				
Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.9	20.0	100	75 - 125
Ethylbenzene	19.6	20.0	98	78 - 123
Isopropylbenzene (Cumene)	21.3	20.0	106	73 - 133
Methyl Acetate	19.6	20.0	98	57 - 157
Methyl tert-Butyl Ether	19.4	20.0	97	75 - 126
Methylcyclohexane	19.8	20.0	99	61 - 125
Styrene	20.0	20.0	100	80 - 132
Tetrachloroethene (PCE)	19.1	20.0	95	72 - 131
Toluene	20.2	20.0	101	78 - 122
Trichloroethene (TCE)	20.0	20.0	100	74 - 127
Trichlorofluoromethane (CFC 11)	20.1	20.0	101	69 - 141
Vinyl Chloride	19.4	20.0	97	72 - 138
cis-1,2-Dichloroethene	20.9	20.0	104	78 - 122
cis-1,3-Dichloropropene	20.5	20.0	103	77 - 125
m,p-Xylenes	39.2	40.0	98	79 - 126
n-Butyl Acetate	20.8	20.0	104	31 - 144
o-Xylene	19.5	20.0	98	77 - 118
trans-1,2-Dichloroethene	19.0	20.0	95	75 - 121
trans-1,3-Dichloropropene	20.9	20.0	104	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Analyzed: 10/31/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 267468

Lab Control Sample
 RQ1111185-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	21.8	20.0	109	72 - 131
1,1,2-Trichloroethane	20.8	20.0	104	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.2	20.0	91	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.5	20.0	102	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.8	20.0	94	72 - 129
1,2,4-Trichlorobenzene	21.3	20.0	107	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	24.2	20.0	121	62 - 131
1,2-Dibromoethane	21.8	20.0	109	78 - 125
1,2-Dichlorobenzene	20.7	20.0	103	79 - 124
1,2-Dichloroethane	21.9	20.0	110	73 - 127
1,2-Dichloropropane	21.0	20.0	105	80 - 123
1,3-Dichlorobenzene	21.4	20.0	107	78 - 124
1,4-Dichlorobenzene	21.2	20.0	106	78 - 123
n-Butanol	1230	1000	122	70 - 130
2-Butanone (MEK)	20.4	20.0	102	60 - 133
2-Hexanone	22.7	20.0	113	61 - 131
4-Methyl-2-pentanone	22.1	20.0	110	61 - 132
Acetone	20.3	20.0	102	54 - 139
Benzene	20.0	20.0	100	78 - 121
Bromodichloromethane	21.8	20.0	109	80 - 125
Bromoform	25.1	20.0	126	68 - 130
Bromomethane	15.2	20.0	76	57 - 144
Carbon Disulfide	22.8	20.0	114	52 - 140
Carbon Tetrachloride	22.0	20.0	110	68 - 133
Chlorobenzene	20.9	20.0	105	80 - 121
Chloroethane	18.9	20.0	94	71 - 130
Chloroform	20.5	20.0	103	78 - 125
Chloromethane	17.4	20.0	87	61 - 138
Cyclohexane	17.5	20.0	87	57 - 126
Dibromochloromethane	24.0	20.0	120	78 - 133
Dichlorodifluoromethane (CFC 12)	17.6	20.0	88	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 10/31/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267468

**Lab Control Sample
 RQ1111185-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.8	20.0	99	75 - 125
Ethylbenzene	20.8	20.0	104	78 - 123
Isopropylbenzene (Cumene)	22.9	20.0	115	73 - 133
Methyl Acetate	20.2	20.0	101	57 - 157
Methyl tert-Butyl Ether	20.2	20.0	101	75 - 126
Methylcyclohexane	17.2	20.0	86	61 - 125
Styrene	21.5	20.0	108	80 - 132
Tetrachloroethene (PCE)	20.8	20.0	104	72 - 131
Toluene	20.4	20.0	102	78 - 122
Trichloroethene (TCE)	20.3	20.0	102	74 - 127
Trichlorofluoromethane (CFC 11)	19.4	20.0	97	69 - 141
Vinyl Chloride	18.9	20.0	94	72 - 138
cis-1,2-Dichloroethene	20.3	20.0	102	78 - 122
cis-1,3-Dichloropropene	21.2	20.0	106	77 - 125
m,p-Xylenes	41.6	40.0	104	79 - 126
n-Butyl Acetate	22.4	20.0	112	31 - 144
o-Xylene	20.9	20.0	105	77 - 118
trans-1,2-Dichloroethene	19.6	20.0	98	75 - 121
trans-1,3-Dichloropropene	21.4	20.0	107	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 1/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267722

Analyte Name	Lab Control Sample RQ1111072-02			Duplicate Lab Control Sample RQ1111072-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	18.4	20.0	92	17.6	20.0	88	72 - 128	5	30
1,1,2,2-Tetrachloroethane	18.5	20.0	92	19.7	20.0	98	72 - 131	6	30
1,1,2-Trichloroethane	17.8	20.0	89	18.3	20.0	91	80 - 122	3	30
1,1,2-Trichloro-1,2,2-trifluoroethane	17.9	20.0	90	16.7	20.0	84	68 - 136	7	30
1,1-Dichloroethane (1,1-DCA)	19.5	20.0	98	18.9	20.0	94	76 - 124	3	30
1,1-Dichloroethene (1,1-DCE)	17.6	20.0	88	16.9	20.0	84	72 - 129	4	30
1,2,4-Trichlorobenzene	18.0	20.0	90	17.9	20.0	90	70 - 133	<1	30
1,2-Dibromo-3-chloropropane (DBCP)	17.6	20.0	88	18.3	20.0	92	62 - 131	4	30
1,2-Dibromoethane	18.2	20.0	91	18.9	20.0	95	78 - 125	4	30
1,2-Dichlorobenzene	19.0	20.0	95	18.7	20.0	93	79 - 124	2	30
1,2-Dichloroethane	19.6	20.0	98	19.8	20.0	99	73 - 127	1	30
1,2-Dichloropropane	19.5	20.0	98	19.1	20.0	95	80 - 123	2	30
1,3-Dichlorobenzene	19.8	20.0	99	19.1	20.0	95	78 - 124	4	30
1,4-Dichlorobenzene	19.5	20.0	98	18.8	20.0	94	78 - 123	4	30
n-Butanol	856	1000	85	873	1000	87	70 - 130	2	30
2-Butanone (MEK)	17.6	20.0	88	17.8	20.0	89	60 - 133	1	30
2-Hexanone	18.6	20.0	93	21.1	20.0	105	61 - 131	13	30
4-Methyl-2-pentanone	18.2	20.0	91	19.7	20.0	99	61 - 132	8	30
Acetone	18.5	20.0	93	18.7	20.0	94	54 - 139	1	30
Benzene	18.8	20.0	94	17.9	20.0	90	78 - 121	5	30
Bromodichloromethane	20.3	20.0	102	20.1	20.0	100	80 - 125	1	30
Bromoform	21.6	20.0	108	21.5	20.0	107	68 - 130	<1	30
Bromomethane	14.2	20.0	71	13.2	20.0	66	57 - 144	7	30
Carbon Disulfide	23.8	20.0	119	24.1	20.0	121	52 - 140	1	30
Carbon Tetrachloride	20.2	20.0	101	19.3	20.0	96	68 - 133	5	30
Chlorobenzene	19.2	20.0	96	18.6	20.0	93	80 - 121	3	30
Chloroethane	18.5	20.0	93	17.8	20.0	89	71 - 130	4	30
Chloroform	19.2	20.0	96	18.9	20.0	94	78 - 125	2	30
Chloromethane	16.0	20.0	80	15.0	20.0	75	61 - 138	6	30
Cyclohexane	19.9	20.0	100	19.4	20.0	97	57 - 126	3	30
Dibromochloromethane	20.7	20.0	104	20.9	20.0	105	78 - 133	<1	30
Dichlorodifluoromethane (CFC 12)	16.1	20.0	80	15.4	20.0	77	45 - 159	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 1/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267722

Analyte Name	Lab Control Sample RQ1111072-02			Duplicate Lab Control Sample RQ1111072-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	18.5	20.0	93	18.2	20.0	91	75 - 125	2	30
Ethylbenzene	19.8	20.0	99	18.5	20.0	93	78 - 123	6	30
Isopropylbenzene (Cumene)	21.6	20.0	108	20.2	20.0	101	73 - 133	6	30
Methyl Acetate	18.0	20.0	90	18.7	20.0	94	57 - 157	4	30
Methyl tert-Butyl Ether	17.1	20.0	86	17.7	20.0	88	75 - 126	3	30
Methylcyclohexane	19.7	20.0	99	19.4	20.0	97	61 - 125	2	30
Styrene	19.5	20.0	97	18.9	20.0	95	80 - 132	3	30
Tetrachloroethene (PCE)	18.9	20.0	95	18.0	20.0	90	72 - 131	5	30
Toluene	19.2	20.0	96	18.5	20.0	92	78 - 122	4	30
Trichloroethene (TCE)	18.5	20.0	92	17.6	20.0	88	74 - 127	5	30
Trichlorofluoromethane (CFC 11)	19.3	20.0	96	17.7	20.0	88	69 - 141	9	30
Vinyl Chloride	18.3	20.0	92	16.9	20.0	84	72 - 138	8	30
cis-1,2-Dichloroethene	19.3	20.0	97	18.9	20.0	94	78 - 122	2	30
cis-1,3-Dichloropropene	19.1	20.0	95	19.1	20.0	96	77 - 125	<1	30
m,p-Xylenes	39.2	40.0	98	37.2	40.0	93	79 - 126	5	30
n-Butyl Acetate	18.6	20.0	93	18.8	20.0	94	31 - 144	1	30
o-Xylene	19.5	20.0	98	18.6	20.0	93	77 - 118	5	30
trans-1,2-Dichloroethene	18.1	20.0	91	17.6	20.0	88	75 - 121	3	30
trans-1,3-Dichloropropene	18.8	20.0	94	18.8	20.0	94	69 - 127	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 2/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 267849

Analyte Name	Lab Control Sample RQ1111238-02			Duplicate Lab Control Sample RQ1111238-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	17.5	20.0	88	17.8	20.0	89	72 - 128	1	30
1,1,2,2-Tetrachloroethane	19.8	20.0	99	20.2	20.0	101	72 - 131	2	30
1,1,2-Trichloroethane	19.3	20.0	97	19.0	20.0	95	80 - 122	2	30
1,1,2-Trichloro-1,2,2-trifluoroethane	16.8	20.0	84	17.1	20.0	85	68 - 136	2	30
1,1-Dichloroethane (1,1-DCA)	18.9	20.0	95	18.9	20.0	95	76 - 124	<1	30
1,1-Dichloroethene (1,1-DCE)	16.6	20.0	83	17.0	20.0	85	72 - 129	2	30
1,2,4-Trichlorobenzene	18.6	20.0	93	18.6	20.0	93	70 - 133	<1	30
1,2-Dibromo-3-chloropropane (DBCP)	19.1	20.0	96	19.1	20.0	96	62 - 131	<1	30
1,2-Dibromoethane	19.9	20.0	99	19.2	20.0	96	78 - 125	4	30
1,2-Dichlorobenzene	19.5	20.0	97	19.1	20.0	95	79 - 124	2	30
1,2-Dichloroethane	20.5	20.0	102	20.4	20.0	102	73 - 127	<1	30
1,2-Dichloropropane	19.2	20.0	96	19.5	20.0	98	80 - 123	1	30
1,3-Dichlorobenzene	19.3	20.0	97	19.7	20.0	98	78 - 124	2	30
1,4-Dichlorobenzene	19.4	20.0	97	19.6	20.0	98	78 - 123	<1	30
n-Butanol	1010	1000	101	1000	1000	100	70 - 130	<1	30
2-Butanone (MEK)	18.5	20.0	92	18.6	20.0	93	60 - 133	<1	30
2-Hexanone	18.7	20.0	93	19.0	20.0	95	61 - 131	2	30
4-Methyl-2-pentanone	18.4	20.0	92	19.1	20.0	96	61 - 132	4	30
Acetone	18.5	20.0	92	19.2	20.0	96	54 - 139	4	30
Benzene	18.1	20.0	91	18.3	20.0	91	78 - 121	<1	30
Bromodichloromethane	20.5	20.0	102	20.0	20.0	100	80 - 125	2	30
Bromoform	22.4	20.0	112	21.8	20.0	109	68 - 130	2	30
Bromomethane	13.5	20.0	68	14.0	20.0	70	57 - 144	4	30
Carbon Disulfide	22.8	20.0	114	22.7	20.0	113	52 - 140	<1	30
Carbon Tetrachloride	19.2	20.0	96	19.1	20.0	95	68 - 133	<1	30
Chlorobenzene	19.3	20.0	96	19.0	20.0	95	80 - 121	1	30
Chloroethane	17.8	20.0	89	17.9	20.0	90	71 - 130	<1	30
Chloroform	19.1	20.0	95	19.4	20.0	97	78 - 125	2	30
Chloromethane	15.1	20.0	76	15.5	20.0	77	61 - 138	2	30
Cyclohexane	17.8	20.0	89	18.8	20.0	94	57 - 126	5	30
Dibromochloromethane	21.6	20.0	108	21.2	20.0	106	78 - 133	2	30
Dichlorodifluoromethane (CFC 12)	15.1	20.0	75	15.5	20.0	77	45 - 159	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Analyzed: 11/ 2/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 267849

Analyte Name	Lab Control Sample RQ1111238-02			Duplicate Lab Control Sample RQ1111238-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	18.7	20.0	93	18.6	20.0	93	75 - 125	<1	30
Ethylbenzene	18.8	20.0	94	18.9	20.0	94	78 - 123	<1	30
Isopropylbenzene (Cumene)	20.3	20.0	102	20.4	20.0	102	73 - 133	<1	30
Methyl Acetate	18.8	20.0	94	18.7	20.0	94	57 - 157	<1	30
Methyl tert-Butyl Ether	18.1	20.0	90	18.3	20.0	91	75 - 126	1	30
Methylcyclohexane	18.0	20.0	90	18.9	20.0	94	61 - 125	4	30
Styrene	19.5	20.0	98	19.0	20.0	95	80 - 132	3	30
Tetrachloroethene (PCE)	18.1	20.0	91	18.3	20.0	92	72 - 131	<1	30
Toluene	18.5	20.0	93	18.8	20.0	94	78 - 122	1	30
Trichloroethene (TCE)	18.0	20.0	90	17.7	20.0	89	74 - 127	1	30
Trichlorofluoromethane (CFC 11)	17.9	20.0	89	18.6	20.0	93	69 - 141	4	30
Vinyl Chloride	17.1	20.0	86	17.8	20.0	89	72 - 138	4	30
cis-1,2-Dichloroethene	18.8	20.0	94	19.1	20.0	96	78 - 122	2	30
cis-1,3-Dichloropropene	19.7	20.0	98	19.5	20.0	98	77 - 125	<1	30
m,p-Xylenes	37.3	40.0	93	37.1	40.0	93	79 - 126	<1	30
n-Butyl Acetate	19.2	20.0	96	18.9	20.0	94	31 - 144	2	30
o-Xylene	18.8	20.0	94	18.6	20.0	93	77 - 118	1	30
trans-1,2-Dichloroethene	17.4	20.0	87	17.5	20.0	87	75 - 121	<1	30
trans-1,3-Dichloropropene	19.1	20.0	96	19.3	20.0	97	69 - 127	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 3/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 268117

Lab Control Sample
RQ1111161-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	26.2	26.0	101	56 - 148
Ethene	23.2	24.3	95	58 - 155
Methane	26.1	26.2	100	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 4/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 268312

Lab Control Sample
RQ1111222-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	30.3	26.0	116	56 - 148
Ethene	27.4	24.3	112	58 - 155
Methane	30.4	26.2	116	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 7/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 268430

Lab Control Sample
RQ1111302-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	25.7	26.0	99	56 - 148
Ethene	22.8	24.3	94	58 - 155
Methane	25.9	26.2	99	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 7/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 268433

Lab Control Sample
RQ1111303-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	23.8	26.0	92	56 - 148
Ethene	22.1	24.3	91	58 - 155
Methane	24.2	26.2	92	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 8/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA
Analysis Lot: 268565

Lab Control Sample
RQ1111335-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	24.3	26.0	93	56 - 148
Ethene	21.8	24.3	90	58 - 155
Methane	24.4	26.2	93	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 9/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 268842

Lab Control Sample
RQ1111426-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	24.4	26.0	94	56 - 148
Ethene	21.4	24.3	88	58 - 155
Methane	24.2	26.2	92	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/ 7/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 268467

Analyte Name	Lab Control Sample RQ1111307-02			Duplicate Lab Control Sample RQ1111307-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.03	1.00	103	1.04	1.00	104	70 - 130	<1	30
Acetic Acid	9.70	10.0	97	9.70	10.0	97	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.84	10.0	98	10.3	10.0	103	78 - 113	4	30
Lactic Acid	8.82	9.97	88	8.82	9.97	88	61 - 109	<1	30
Propionic Acid	9.07	9.97	91	8.66	9.97	87	80 - 125	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272 10/25-27/11
 Sample Matrix: Water

Service Request: R1106024
 Date Analyzed: 11/ 9/11

Lab Control Sample Summary
 Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
 Basis: NA

Analysis Lot: 268843

Analyte Name	Lab Control Sample RQ1111427-02			Duplicate Lab Control Sample RQ1111427-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.08	1.00	108	1.04	1.00	104	70 - 130	4	30
Acetic Acid	9.47	10.0	95	9.50	10.0	95	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.48	10.0	95	9.84	10.0	98	78 - 113	4	30
Lactic Acid	9.08	9.97	91	8.99	9.97	90	61 - 109	<1	30
Propionic Acid	8.42	9.97	84	8.47	9.97	85	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/11/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 269418

Analyte Name	Lab Control Sample RQ1111632-02			Duplicate Lab Control Sample RQ1111632-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.02	1.00	102	1.04	1.00	104	70 - 130	2	30
Acetic Acid	9.23	10.0	92	9.26	10.0	93	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.3	10.0	103	10.6	10.0	106	78 - 113	2	30
Lactic Acid	8.78	9.97	88	8.85	9.97	89	61 - 109	<1	30
Propionic Acid	8.79	9.97	88	8.64	9.97	87	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272 10/25-27/11
Sample Matrix: Water

Service Request: R1106024
Date Analyzed: 11/14/11 - 11/15/11

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 269468

Analyte Name	Lab Control Sample RQ1111655-02			Duplicate Lab Control Sample RQ1111655-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.02	1.00	102	1.04	1.00	104	70 - 130	2	30
Acetic Acid	9.35	10.0	94	9.33	10.0	93	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.87	10.0	99	9.74	10.0	97	78 - 113	1	30
Lactic Acid	9.10	9.97	91	9.18	9.97	92	61 - 109	<1	30
Propionic Acid	8.45	9.97	85	8.35	9.97	84	80 - 125	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: Rachel Donahue

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-BW0001A-024.5-20111025	10/25/2011			W
LC34-BW0001B-031.5-20111025	10/25/2011			W
LC34-BW0001C-038.5-20111025	10/25/2011			W
LC34-BW0001D-045.5-20111025	10/25/2011			W
LC34-IW0076-075.0-20111025	10/25/2011	15:02	001,002	W
LC34-BW0001A-024.5-20111025	10/25/2011	9:55	003,004	W
LC34-BW0001B-031.5-20111025	10/25/2011	10:55	005,006	W
LC34-BW0001C-038.5-20111025	10/25/2011	11:41	007-008	W
LC34-BW0001D-045.5-20111025	10/25/2011	14:40	009,010	W

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD


RELINQUISHED BY:
 Signature: Rachel Donahue
 Printed Name: Rachel Donahue
 Firm: Geosyntec Consultants
 Date/Time: 10/25/11 10:30

RECEIVED BY:
 Signature: [Signature]
 Printed Name: FEDER
 Firm: FEDER
 Date/Time: _____

Analysis Requested											REMARKS
Number of Containers	VOCs (826C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)		
16	3	2	1	3	1	3	1	1	1	1	REP 10/25
16	3	2	1	3	1	3	1	1	1	1	REP 10/25
16	3	2	1	3	1	3	1	1	1	1	REP 10/25
16	3	2	1	3	1	3	1	1	1	1	REP 10/25
16	3	2	1	3	1	3	1	1	1	1	REP 10/25
13	3	2	1	3	1	3	1	1	1	1	
16	3	2	1	3	1	3	1	1	1	1	
16	3	2	1	3	1	3	1	1	1	1	
16	3	2	1	3	1	3	1	1	1	1	
16	3	2	1	3	1	3	1	1	1	1	

Comments/Special Instructions:

R1106024
 GeoSyntec Consultants
 ESTCP PED LC34 TR0272 10/26/11



RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: [Name]
 Firm: CAS
 Date/Time: 10/26/11 7:00 1000

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A

Project Manager: Cory Repta Company: Geosyntec

Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880

City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: Rachel Donahue *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-BW0001E-052.5-20111025	10/25/2011	14:00	-011, 012	W
LC34-BW0001F-059.5-20111025	10/25/2011	13:15	-013, 014	W
LC34-BW0002A-045.5-20111025	10/25/2011			W
LC34-BW0002B-045.5-20111025	10/25/2011			W
LC34-BW0002C-045.5-20111025	10/25/2011			W
LC34-BW0002D-045.5-20111025	10/25/2011			W
LC34-BW0002E-052.5-20111025	10/25/2011			W
LC34-BW0002F-052.5-20111025	10/25/2011			W
LC34-BW0002G-045.5-20111025	10/25/2011			W
LC34-BW0002H-045.5-20111025	10/25/2011			W

TURNAROUND REQUIREMENTS

24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS

I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

INVOICE INFORMATION

P.O. # _____
 Bill to: TR0272A

RELINQUISHED BY:

Signature: Rachel Donahue
 Printed Name: Rachel Donahue
 Firm: Geosyntec Consultants
 Date/Time: 10/25/11 16:30

RECEIVED BY:

Signature: [Signature]
 Printed Name: [Name]
 Firm: [Firm]
 Date/Time: _____

Number of Containers	Analysis Requested							REMARKS		
	VOCs (826C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MES (RSK 175)	Anions (300.0)		Alkalinity (310.1)	Dissolved Metals (6010B)
16	3	2	1	3	1	3	1	1	1	
16	3	2	1	3	1	3	1	1	1	
12	3	2	1	3	1	3	1	1	1	KED 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25
12	3	2	1	3	1	3	1	1	1	REP 10/25

Comments/Special Instructions:

R1106024
 GeoSyntec Consultants
 ESTCP PED LC34 TR0272 10/26/11



RELINQUISHED BY:

Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:

Signature: [Signature]
 Printed Name: [Name]
 Firm: CAS
 Date/Time: 10/26/11 10:00

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: Rachel Donahue

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-1W0003C-038.5-201110	10/25/2011	12:02	-015	W	15	3	2	1	1	1	1	1	1	1	RED 10/25
LC34-1W0003D-040.5-201110	10/25/2011	13:36	-016	W	12	3	2	1	1	1	1	1	1	1	RED 10/25
LC34-1W0003E-052.5-201110	10/25/2011	11:00	-017	W	12	3	2	1	1	1	1	1	1	1	RED 10/25
LC34-1W0003F-068.0-201110	10/25/2011	11:24	-018	W	12	3	2	1	1	1	1	1	1	1	RED 10/25
LC34-1W0003G-070.0-201110	10/25/2011	10:04	-019	W	12	3	2	1	1	1	1	1	1	1	RED 10/25
LC34-1W0003H-070.0-201110	10/25/2011	10:26	-020	W	12	3	2	1	1	1	1	1	1	1	RED 10/25

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

R11000004

RELINQUISHED BY: Rachel Donahue Signature: _____
 Printed Name: Rachel Donahue
 Firm: Geosyntec Consultants
 Date/Time: 10/25/11 16:30

RECEIVED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY: _____
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY: _____
 Signature: Gregory Lafont
 Printed Name: Gregory Lafont
 Firm: CAS
 Date/Time: 10/26/11 1000

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: <u>ESTICP PED LC34</u> Project Number: <u>TR0272A</u>		Company: <u>Geosyntec</u>	
Project Manager: <u>Corv Repta</u>		Company: <u>Geosyntec</u>	
Company/Address: <u>6770 South Washington Ave STE #3</u> Phone: <u>321-269-5880</u>			
City, State, Zip: <u>Titusville, FL 32780</u> FAX: <u>321-269-5880</u>			
Sampler's Signature: <u>Rachel Donahue</u>			

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-TB-201110 25	10/25/2011	N/A	024		3	3									
					0										
					0										
					0										
					0										
					0										
					0										
					0										
					0										
					0										
					0										
					0										
					0										

TURNAROUND REQUIREMENTS 24 hr <input type="checkbox"/> 48 hr <input type="checkbox"/> 5 BD <input type="checkbox"/> <input checked="" type="checkbox"/> Standard (15 BD) Provide FAX Preliminary Results Requested Report Date: _____ Invoice Information P.O. # _____ Bill to: <u>TR0272A</u>	REPORT REQUIREMENTS I. Routine Report: Results and Method Blank (Surrogate, as required) II. Results w/ QC (Dup., MS, MSD as req) III. Results (with QC and Calibration Summaries) IV. ASP-B V. CLP X <input checked="" type="checkbox"/> EDD?: <u>NASA KEDD</u>
--	---

RELINQUISHED BY: Signature: <u>Rachel Donahue</u> Printed Name: <u>Rachel Donahue</u> Firm: <u>Geosyntec Consultants</u> Date/Time: <u>10/25/11 16:30</u>	RECEIVED BY: Signature: <u>Rachel Donahue</u> Printed Name: <u>Rachel Donahue</u> Firm: <u>Geosyntec Consultants</u> Date/Time: <u>10/25/11 16:30</u>
--	--

RELINQUISHED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	RECEIVED BY: Signature: <u>Suey de la...</u> Printed Name: <u>Suey de la...</u> Firm: <u>CAS</u> Date/Time: <u>9/26/11 1000</u>
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R1106024

Comments/Special Instructions:

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: Rachel Danahue

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0001B-031.5-20111025-D	10/25/2011	10:55	005 QC KB 10/20/11W	W	3	3									
LC34-BW0001C-032.0-20111025-D	10/25/2011			W	2		2								RED 10/25
LC34-BW0001D-033.5-20111025-D	10/25/2011			W	2		2								RED w/29
LC34-BW0002A-034.5-20111025-D	10/25/2011			W	2		2	1							RED 10/25
LC34-BW0000A-037.5-20111025-D	10/25/2011	9:55	003 QC KB 10/20/11W	W	3				3						
LC34-BW0001A-024.5-20111025-D	10/25/2011	9:55	003 QC KB 10/20/11W	W	1			1							
LC34-BW0001C-038.5-20111025-D	10/25/2011	11:41	007 QC KB 10/20/11W	W	3						3				
LC34-BW0001D-045.5-20111025-D	10/25/2011	14:40	009 QC KB 10/20/11W	W	1							1			
LC34-BW0002B-039.5-20111025-D	10/25/2011			W	1										RED 10/25
LC34-BW0002C-042.5-20111025-D	10/25/2011			W	1										RED 10/25

Comments/Special Instructions:
 samples with -D suffix are QC volume for MS/MSD analysis
 "D = QC as per Corv Repta 10/26/11 KB
 R110600AM

TURNAROUND REQUIREMENTS 24 hr <u>48</u> hr <u>5</u> BD <input checked="" type="checkbox"/> Standard (15 BD) Provide FAX Preliminary Results Requested Report Date: _____	REPORT REQUIREMENTS I. Routine Report: Results and Method Blank (Surrogate, as required) II. Results w/ QC (Dup., MS, MSD as req) III. Results (with QC and Calibration Summaries) IV. ASP-B V. CLP <input checked="" type="checkbox"/> EDD?; NASA KEDD	RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>F. E. DE</u> Firm: <u>Geosyntec consultants</u> Date/Time: <u>10/25/11 10:30</u>	RECEIVED BY: Signature: <u>[Signature]</u> Printed Name: <u>Gregory Lafont</u> Firm: <u>CAS</u> Date/Time: <u>10/26/11 10:00</u>
RELINQUISHED BY: Signature: <u>[Signature]</u> Printed Name: _____ Firm: _____ Date/Time: _____	RELINQUISHED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	RELINQUISHED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	RELINQUISHED BY: Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____

Cooler Receipt And Preservation Check Form

Project/Client Asogatec Folder Number R1106004

Cooler received on 10/26/11 by: (R) COURIER: CAS UPS (FEDEX) VELOCITY CLIENT

1. Were custody seals on outside of cooler? (YES) NO
 2. Were custody papers properly filled out (ink, signed, etc.)? (YES) NO
 3. Did all bottles arrive in good condition (unbroken)? (YES) NO
 4. Did (VOA vials), Alkalinity, or Sulfide have significant* air bubbles? (YES) NO N/A / T.B. vial
 5. Were Ice or Ice packs present? (YES) NO
 6. Where did the bottles originate? (CAS/ROO), CLIENT
 7. Temperature of cooler(s) upon receipt: 6.0° 3.5° _____
- Is the temperature within 0° - 6° C?: (Yes) (Yes) Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 10/26/11 1009

Thermometer ID: IR GUN#3 (IR GUN#4) Reading From: (Temp Blank) / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 10/26/11

Cooler Breakdown: Date: 10/26/11 Time: 1345 by: (R)

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? (YES) NO
2. Did all bottle labels and tags agree with custody papers? (YES) NO
3. Were correct containers used for the tests indicated? (YES) NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			<u>WC 103138c</u>	<u>8/12</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC103138d</u>	<u>10/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103098c</u>	<u>5/12</u>				
	HCl	*	*	<u>4111010</u>	<u>9/12</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 1-194-001, 090511-2JJ,
Other Comments: _____

PC Secondary Review: KB 11/17/11

*significant air bubbles: VOA > 5-6 mm ; WC > 1 in. diameter

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609
585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFA's (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0002A-024.5-20111026	10/26/2011	950	0025	W	12	3	2	1	3		3				
LC34-BW0002B-031.5-20111026	10/26/2011	910	0026	W	12	3	2	1	3		3				
LC34-BW0002C-038.5-20111026	10/26/2011	1025	0027	W	15	3	2	1	3	1	3	1	1		
LC34-BW0002C-038.5-20111026-D	10/26/2011	1025	0027	W	1								1		
LC34-BW0002D-045.5-20111026	10/26/2011	1110	0028	W	12	3	2	1	3		3				
LC34-BW0002E-052.5-20111026	10/26/2011	1230	0029	W	12	3	2	1	3		3				
LC34-BW0002F-059.5-20111026	10/26/2011	1300	0030	W	12	3	2	1	3		3				
LC34-BW0003A-024.5-20111026	10/26/2011	1332	0031	W	12	3	2	1	3		3				
LC34-BW0003D-045.5-20111026	10/26/2011	1409	0032	W	12	3	2	1	3		3				
LC34-TB-20111026	10/26/2011	NA	0033		3	3									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 samples with -D suffix are QC volume for MS/MSD analysis

R1106024
 Geosyntec Consultants
 ESTCP PED LC34 TR0272 10/26/11



RELIQUISHED BY: [Signature]
 Signature: [Signature] Printed Name: Jessica Hall
 Firm: CAS Date/Time: 10/27/11 0940

RECEIVED BY: [Signature]
 Signature: [Signature] Printed Name: Jessica Hall
 Firm: CAS Date/Time: 10/27/11 0940

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20111026	10/26/2011	923	-034-035	W
LC34-RW0007-038.5-20111026-D	10/26/2011	923	-034-035	W
LC34-RW0008-052.0-20111026	10/26/2011	1005	-036-037	W
LC34-RW0008-052.0-20111026-D	10/26/2011	1005	036-037	W
LC34-IW00021-027.5-20111026	10/26/2011	1100	-038-039	W
LC34-IW00021-027.5-20111026-D	10/26/2011	1100	-038-039	W
LC34-IW0002D-037.5-20111026	10/26/2011	1232	-040-041	W
LC34-IW0002D-037.5-20111026-D	10/26/2011	1232	-040-041	W
LC34-IW0002DI-052.5-20111026	10/26/2011	1340	-042-043	W
LC34-IW0002DI-052.5-20111026-D	10/26/2011	1340	-042-043	W

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barette
 Firm: GEOSYNTEC
 Date/Time: 10/26/11 - 1630

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEES (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
16	3	2	1	3	1	3	1	1	1	
2		2								
16	3	2	1	3	1	3	1	1	1	
3	3									
16	3	2	1	3	1	3	1	1	1	
1			1							
16	3	2	1	3	1	3	1	1	1	
3				3						
16	3	2	1	3	1	3	1	1	1	
1										

Comments/Special Instructions:
 samples with -D suffix are QC volume for MS/MSD analysis

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Jessica Hall
 Firm: CAS
 Date/Time: 10/27/11 0940

R1106024
 GeoSynTec Consultants
 ESTCP PED LC34 TR0272 10/26/11



Cooler Receipt And Preservat

R1106024

GeoSyntec Consultants
ESTCP PED LC34 TR0272 10/25/11



Project/Client GeoSyntec Folder Number

Cooler received on 10/27/11 by JH/GC COURIER: CAS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO ^{10/27}
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO ^{N/A}
 - Were ~~Ice~~ or Ice packs present? YES NO
 - Where did the bottles originate? CAS/ROE, CLIENT
 - Temperature of cooler(s) upon receipt: 5.3 2.6 2.0
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 10/27/11 0953

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: CB 10/27/11

Cooler Breakdown: Date: 10/27/11 Time: 1310 by: JH

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			<u>WC10313PC</u>	<u>8/12</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC10309PC</u>	<u>5/12</u>				
	HCl	*	*	<u>4111010</u>	<u>9/12</u>				

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 1-194-001, 1-132-001, 090511-25J, 082911-2EE

Other Comments:
 * 1 broken vial for RSL-175 at location LC34-Bub002A-0245-201106
 * 1 vial with air bubble for locations LC34-BW0002H-0245-201106,
 JW0002DI-0525,
 BW0002B-0315,
 BW0003A-1332

PC Secondary Review: CB 11/17/11 *significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Columbia Analytical Services

1 Mustard Street, Rochester, NY 14609

585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec
 Company/Address: 6770 South Washington Ave STE #3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5880
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0003B-031.5-20111027	10/27/2011		-044	W	12	3	2	1	3		3				
LC34-BW0003C-038.5-20111027	10/27/2011		-045	W	15	3	2	1	3	1	3	1	1		
LC34-BW0003E-052.5-20111027	10/27/2011		-046	W	12	3	2	1	3		3				
LC34-BW0003F-059.5-20111027	10/27/2011		-047	W	12	3	2	1	3		3				
LC34-TB-20111027	10/27/2011		-048	W	3	3									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

RECEIVED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARRETT
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 10/27/11 - 1030

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Daniel Ward
 Firm: CAS
 Date/Time: 10/28/11/ 0959

R11106024

GeoSyntec Consultants
 ESTCP PED LC34 TR0272 10/25/11



Comments/Special Instructions:

Cooler Receipt And Preservation

R1106024

GeoSyntec Consultants
ESTCP PED LC34 TR0272 10/26/11

Project/Client GeoSyntec Folder Number _____



Cooler received on 10/28/11 by: slw COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were ~~ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROG, CLIENT
7. Temperature of cooler(s) upon receipt: 1.2

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 10/28/11/100

Thermometer ID: IR ~~GUN#3~~ / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: CS 10/28/11

Cooler Breakdown: Date: 10/28/11 Time: 1300 by: JH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC03382</u>	<u>10/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	<u>411100</u>	<u>9/12</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: 1-194-001, 090511-251, 1-132-001, 082911-211
Other Comments: _____

PC Secondary Review: CS 11/17/11

*significant air bubbles: VOA > 5-6 mm ; WC > 1 in. diameter

Certificate of Analysis: Gene-Trac® *Dehalococcoides* Assay

Customer: Cory Repta, Geosyntec Consultants

SiREM Reference: S-2368

Project: LC34

Report Date: 10-Oct-11

Customer Reference: TR0272A

Data Files: MyiQ-DB-DHC-QPCR-0245
 MyiQ-DHC-QPCR-0837
 iQ5-DHC-QPCR-0839

Table 1: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc *	<i>Dehalococcoides</i> Enumeration/Liter **
LC34-RW0007-038.5-20111026	DHC-7761	26-Oct-11	Groundwater	16-40%	1 x 10 ⁸
LC34-RW0008-052.0-20111026	DHC-7762	26-Oct-11	Groundwater	23-55%	3 x 10 ⁸
LC34-BW0001C-038.5-20111025	DHC-7763	25-Oct-11	Groundwater	0.7-2%	6 x 10 ⁶
LC34-BW0003C-038.5-20111027	DHC-7770	27-Oct-11	Groundwater	33-72%	5 x 10 ⁸
LC34-BW0001E-052.5-20111025	DHC-7765	25-Oct-11	Groundwater	2-5%	7 x 10 ⁶
LC34-BW0003E-052.5-20111027	DHC-7766	27-Oct-11	Groundwater	0.2-0.7%	2 x 10 ⁶

Notes:

* Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample. Range represents normal variation in Dhc enumeration.

** Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.

U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *Dehalococcoides* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

Analyst: 

Kela Bartle, B.Sc.
Biotechnology Technologist

Approved: 

Ximena Druar, B.Sc.
Molecular Biology Coordinator

Table 2.1: Detailed Test Parameters, Gene-Trac Test Reference S-2368

Customer Sample ID	LC34-RW0007-038.5-20111026	LC34-RW0008-052.0-20111026	LC34-BW0001C-038.5-20111025
SiREM Sample ID	DHC-7761	DHC-7762	DHC-7763
Date Received	28-Oct-11	28-Oct-11	28-Oct-11
Sample Temperature	6 °C	6 °C	6 °C
Filtration Date	3-Nov-11	3-Nov-11	3-Nov-11
Volume Used for DNA Extraction	500 mL	400 mL	500 mL
DNA Extraction Date	3-Nov-11	3-Nov-11	3-Nov-11
DNA Concentration in Sample (extractable)	1187 ng/L	2258 ng/L	1724 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
qPCR Date Analyzed	3-Nov-11	3-Nov-11	3-Nov-11
Laboratory Controls (see Table 3)	Passed	Passed	Passed
Comments	--	--	--

Notes:

Refer to Table 3 for detailed results of controls.

°C = degrees Celsius

DNA = Deoxyribonucleic acid

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = *Dehalococcoides*

ng/L = nanograms per liter

mL = milliliters

Table 2.2: Detailed Test Parameters, Gene-Trac Test Reference S-2368

Customer Sample ID	LC34-BW0003C-038.5-20111027	LC34-BW0001E-052.5-20111025	LC34-BW0003E-052.5-20111027
SiREM Sample ID	DHC-7770	DHC-7765	DHC-7766
Date Received	28-Oct-11	28-Oct-11	28-Oct-11
Sample Temperature	6 °C	6 °C	6 °C
Filtration Date	3-Nov-11	3-Nov-11	3-Nov-11
Volume Used for DNA Extraction	400 mL	500 mL	500 mL
DNA Extraction Date	3-Nov-11	3-Nov-11	3-Nov-11
DNA Concentration in Sample (extractable)	2629 ng/L	805 ng/L	1518 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
qPCR Date Analyzed	9-Nov-11	3-Nov-11	3-Nov-11
Laboratory Controls (see Table 3)	Passed	Passed	Passed
Comments	--	--	--

Notes:

Refer to Table 3 for detailed results of controls.

°C = degrees Celsius

DNA = Deoxyribonucleic acid

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = *Dehalococcoides*

ng/L = nanograms per liter

mL = milliliters

Table 3: Experimental Control Results, Gene-Trac Test Reference S-2368

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Liter	Recovered Dhc 16S rRNA Gene Copies per Liter	Comments
Positive Control Low Concentration	3-Nov-11	qPCR with KB1 genomic DNA (CSLD-0474)	2.5×10^5	2.1×10^5	--
Positive Control High Concentration	3-Nov-11	qPCR with KB1 genomic DNA (CSHD-0474)	2.7×10^7	4.2×10^7	--
DNA Extraction Blank	3-Nov-11	DNA extraction sterile water (FB-1558)	0	3.9×10^3 U	--
Negative Control	3-Nov-11	Tris Reagent Blank (TBD-0434)	0	3.9×10^3 U	--
Positive Control Low Concentration	9-Nov-11	qPCR with KB1 genomic DNA (CSLD-0476)	3.4×10^5	2.4×10^5	--
Positive Control High Concentration	9-Nov-11	qPCR with KB1 genomic DNA (CSHD-0476)	4.6×10^7	2.7×10^7	--
Negative Control	9-Nov-11	Tris Reagent Blank (TBD-0436)	0	3.9×10^3 U	--

Notes:

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.



Chain-of-Custody Form

130 Research Lane, Suite 2 • Guelph, Ontario, Canada N1G 5G3 • Phone (519) 822-2265 or toll free 1-866-251-1747 Fax (519) 822-3151

www.siremlab.com

2011

Page 1 of 1

Lab # S-2368

Project Name LC34		Project # TR0272A		Analysis																		
Project Manager CORY REPTA				Preservative																		
Email Address crepta@geosyntec.com																Preservative Key 0. None 1. HCl 2. Other _____ 3. Other _____						
Company GEOSYNTEC CONSULTANTS																						
Address 130 RESEARCH LANE, STE. 2 GUELPH, ON CANADA																						
Phone # 519-822-2230		Fax #																				
Sampler's Signature 		Sampler's Printed Name JOSEPH BARTLETT																				
Customer Sample ID		Sampling		Matrix	# of Containers													Other Information				
		Date	Time																			
LC34-RW0007-038.5-2011026		10/26/11	0923	W	1	X	X															
LC34-RW0008-052.0-2011026		10/26/11	1005	W	1	X	X															
LC34-BW0001C-038.5-2011025		10/25/11	1141	W	1	X	X															
LC34-BW0003C-038.5-2011027		10/27/11	1055	W	1	X	X															
LC34-BW0001E-052.5-2011025		10/25/11	1400	W	1	X	X															
LC34-BW0003E-052.5-2011027		10/27/11	1018	W	1	X	X															

Cooler Condition: Sample Receipt Good		P.O. #		Billing Information		Turnaround Time Requested		For Lab Use Only			
Cooler Temperature: 6°C		Bill To:				Normal <input type="checkbox"/>		Proposal #: _____			
Custody Seals: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						Rush <input type="checkbox"/>					

Relinquished By: Signature 		Received By: Signature 		Relinquished By: Signature		Received By: Signature	
Printed Name JOSEPH BARTLETT		Printed Name J. Wilkinson		Printed Name		Printed Name	
Firm GEOSYNTEC		Firm SIREM		Firm		Firm	
Date/Time 10/27/11 - 1630		Date/Time 10/28/11 17:10		Date/Time		Date/Time	

December 06, 2011

Service Request No: R1106413

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 11/10/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on November 11, 2011. For your reference, these analyses have been assigned our service request number **R1106413**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 11/10/11
Sample Matrix: Water

Service Request No.: R1106413
Date Received: 11/11/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 11/10/11 and were received for analysis at Columbia Analytical Services from 11/10/11 via a national courier. The samples were received at a cooler temperature of 3.4°C within the guidelines of 0-6°C. No bottle breakage or vial headspace was noted upon sample receipt.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Volatile Organics GC

Two (2) samples were analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limit. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Approved by Deon Barber Date 11/11/11

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Bromide, Iodide, Chloride, Nitrate, and Sulfate by IC method 300.0 and Nitrite by method 353.2. Two (2) water samples were analyzed for dissolved metals by ICP method 6010C. These soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All LCS recoveries were within acceptance limits. The LCS and LCSD for Sulfide were within QC limits. The Relative Percent Difference (RPD) calculation was acceptable.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Approved by

Karen Benker

Date

12/7/11

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111110
Lab Code: R1106413-001

Service Request: R1106413
Date Collected: 11/10/11 1024
Date Received: 11/11/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	470	mg/L	2.0	1	NA	11/16/11 09:00	
Bromide	300.0	21.4	mg/L	1.0	10	NA	11/30/11 03:37	
Carbon, Total Organic (TOC), Average	9060A	222	mg/L	20	20	NA	11/11/11 20:13	
Chloride	300.0	472	mg/L	20	100	NA	11/11/11 18:04	
Iodide	300.0	12.9	mg/L	2.0	10	NA	12/2/11 13:34	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	11/11/11 17:50	
Nitrite as Nitrogen	353.2	0.010 U	mg/L	0.010	1	NA	11/11/11 14:07	
Sulfate	300.0	2.0 U	mg/L	2.0	10	NA	11/11/11 17:50	
Sulfide, Total	SM 4500-S2- F	16.1	mg/L	0.97	1	NA	11/11/11 12:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111110 Dissolved
Lab Code: R1106413-002

Service Request: R1106413
Date Collected: 11/10/11 1024
Date Received: 11/11/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 19:45	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/14/11	11/18/11 19:45	
Manganese, Dissolved	6010C	22		µg/L	10	1	11/14/11	11/18/11 19:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/10/11
 Sample Matrix: Water
 Sample Name: LC34-RW0007-038.5-20111110
 Lab Code: R1106413-001

Service Request: R1106413
 Date Collected: 11/10/11 1024
 Date Received: 11/11/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	11/14/11 15:22		269539	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,1,2-Trichloroethane	500	U	500	23	100	NA	11/14/11 15:22		269539	
1,1,2-Trichloro-1,2,2-trifluoroethane	12000		500	31	100	NA	11/14/11 15:22		269539	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	11/14/11 15:22		269539	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	11/14/11 15:22		269539	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	11/14/11 15:22		269539	
1,2-Dibromoethane	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,2-Dichlorobenzene	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,2-Dichloroethane	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,2-Dichloropropane	500	U	500	29	100	NA	11/14/11 15:22		269539	
1,3-Dichlorobenzene	500	U	500	20	100	NA	11/14/11 15:22		269539	
1,4-Dichlorobenzene	500	U	500	20	100	NA	11/14/11 15:22		269539	
n-Butanol	25000	U	25000	1100	100	NA	11/14/11 15:22		269539	
2-Butanone (MEK)	1000	U	1000	51	100	NA	11/14/11 15:22		269539	
2-Hexanone	1000	U	1000	35	100	NA	11/14/11 15:22		269539	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	11/14/11 15:22		269539	
Acetone	1000	U	1000	98	100	NA	11/14/11 15:22		269539	
Benzene	500	U	500	21	100	NA	11/14/11 15:22		269539	
Bromodichloromethane	500	U	500	20	100	NA	11/14/11 15:22		269539	
Bromoform	500	U	500	27	100	NA	11/14/11 15:22		269539	
Bromomethane	500	U	500	31	100	NA	11/14/11 15:22		269539	
Carbon Disulfide	1000	U	1000	20	100	NA	11/14/11 15:22		269539	
Carbon Tetrachloride	500	U	500	27	100	NA	11/14/11 15:22		269539	
Chlorobenzene	500	U	500	20	100	NA	11/14/11 15:22		269539	
Chloroethane	500	U	500	31	100	NA	11/14/11 15:22		269539	
Chloroform	500	U	500	22	100	NA	11/14/11 15:22		269539	
Chloromethane	500	U	500	24	100	NA	11/14/11 15:22		269539	
Cyclohexane	1000	U	1000	24	100	NA	11/14/11 15:22		269539	
Dibromochloromethane	500	U	500	20	100	NA	11/14/11 15:22		269539	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	11/14/11 15:22		269539	
Dichloromethane	500	U	500	22	100	NA	11/14/11 15:22		269539	
Ethylbenzene	500	U	500	20	100	NA	11/14/11 15:22		269539	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	11/14/11 15:22		269539	
Methyl Acetate	1000	U	1000	23	100	NA	11/14/11 15:22		269539	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111110
Lab Code: R1106413-001

Service Request: R1106413
Date Collected: 11/10/11 1024
Date Received: 11/11/11

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	11/14/11 15:22		269539	
Methylcyclohexane	1000	U	1000	25	100	NA	11/14/11 15:22		269539	
Styrene	500	U	500	20	100	NA	11/14/11 15:22		269539	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	11/14/11 15:22		269539	
Toluene	500	U	500	20	100	NA	11/14/11 15:22		269539	
Trichloroethene (TCE)	3500		500	23	100	NA	11/14/11 15:22		269539	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	11/14/11 15:22		269539	
Vinyl Chloride	6400		500	23	100	NA	11/14/11 15:22		269539	
cis-1,2-Dichloroethene	16000		500	20	100	NA	11/14/11 15:22		269539	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	11/14/11 15:22		269539	
m,p-Xylenes	500	U	500	20	100	NA	11/14/11 15:22		269539	
n-Butyl Acetate	500	U	500	21	100	NA	11/14/11 15:22		269539	
o-Xylene	500	U	500	20	100	NA	11/14/11 15:22		269539	
trans-1,2-Dichloroethene	200	I	500	20	100	NA	11/14/11 15:22		269539	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	11/14/11 15:22		269539	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	11/14/11 15:22	
Dibromofluoromethane	102	89-119	11/14/11 15:22	
Toluene-d8	106	87-121	11/14/11 15:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: 11/10/11 10:24
Date Received: 11/11/11
Date Analyzed: 11/14/11 13:01

Sample Name: LC34-RW0007-038.5-20111110
Lab Code: R1106413-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1145.run

Analysis Lot: 269416
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	44		5.0	
74-85-1	Ethene	150		5.0	
74-82-8	Methane	520		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: 11/10/11 1024
Date Received: 11/11/11
Date Analyzed: 11/15/11 21:15

Sample Name: LC34-RW0007-038.5-201111110
Lab Code: R1106413-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\111511\X0006807.D\

Analysis Lot: 269617
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	2.5	U	2.5	
64-19-7	Acetic Acid	270		5.0	
107-92-6	Butanoic Acid (Butyric Acid)	240		10	
50-21-5	Lactic Acid	5.0	U	5.0	
79-09-4	Propionic Acid	16		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111110
Lab Code: R1106413-003

Service Request: R1106413
Date Collected: 11/10/11 1059
Date Received: 11/11/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	300		mg/L	2.0	1	NA	11/16/11 09:00	
Bromide	300.0	4.5		mg/L	1.0	10	NA	11/30/11 05:06	
Carbon, Total Organic (TOC), Average	9060A	59.2		mg/L	4.0	4	NA	11/11/11 21:33	
Chloride	300.0	652		mg/L	20	100	NA	11/11/11 18:33	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	12/2/11 13:57	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	11/11/11 18:18	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	11/11/11 14:09	
Sulfate	300.0	7.3		mg/L	2.0	10	NA	11/11/11 18:18	
Sulfide, Total	SM 4500-S2- F	14.4		mg/L	0.96	1	NA	11/11/11 12:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111110 Dissolved
Lab Code: R1106413-004

Service Request: R1106413
Date Collected: 11/10/11 1059
Date Received: 11/11/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 19:50	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/14/11	11/18/11 19:50	
Manganese, Dissolved	6010C	16		µg/L	10	1	11/14/11	11/18/11 19:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/10/11
 Sample Matrix: Water
 Sample Name: LC34-RW0008-052.0-20111110
 Lab Code: R1106413-003

Service Request: R1106413
 Date Collected: 11/10/11 1059
 Date Received: 11/11/11

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	2.4	10	NA	11/14/11 15:52		269539	
1,1,2,2-Tetrachloroethane	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,1,2-Trichloroethane	50	U	50	2.4	10	NA	11/14/11 15:52		269539	
1,1,2-Trichloro-1,2,2-trifluoroethane	1500		50	3.1	10	NA	11/14/11 15:52		269539	
1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,1-Dichloroethene (1,1-DCE)	7.7	I	50	2.9	10	NA	11/14/11 15:52		269539	
1,2,4-Trichlorobenzene	50	U	50	2.6	10	NA	11/14/11 15:52		269539	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	10	NA	11/14/11 15:52		269539	
1,2-Dibromoethane	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,2-Dichlorobenzene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,2-Dichloroethane	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,2-Dichloropropane	50	U	50	2.9	10	NA	11/14/11 15:52		269539	
1,3-Dichlorobenzene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
1,4-Dichlorobenzene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
n-Butanol	2500	U	2500	110	10	NA	11/14/11 15:52		269539	
2-Butanone (MEK)	100	U	100	5.1	10	NA	11/14/11 15:52		269539	
2-Hexanone	100	U	100	3.5	10	NA	11/14/11 15:52		269539	
4-Methyl-2-pentanone	100	U	100	2.7	10	NA	11/14/11 15:52		269539	
Acetone	100	U	100	9.8	10	NA	11/14/11 15:52		269539	
Benzene	50	U	50	2.1	10	NA	11/14/11 15:52		269539	
Bromodichloromethane	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Bromoform	50	U	50	2.7	10	NA	11/14/11 15:52		269539	
Bromomethane	50	U	50	3.1	10	NA	11/14/11 15:52		269539	
Carbon Disulfide	100	U	100	2.0	10	NA	11/14/11 15:52		269539	
Carbon Tetrachloride	50	U	50	2.7	10	NA	11/14/11 15:52		269539	
Chlorobenzene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Chloroethane	50	U	50	3.1	10	NA	11/14/11 15:52		269539	
Chloroform	50	U	50	2.2	10	NA	11/14/11 15:52		269539	
Chloromethane	50	U	50	2.4	10	NA	11/14/11 15:52		269539	
Cyclohexane	100	U	100	2.4	10	NA	11/14/11 15:52		269539	
Dibromochloromethane	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	10	NA	11/14/11 15:52		269539	
Dichloromethane	50	U	50	2.2	10	NA	11/14/11 15:52		269539	
Ethylbenzene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Isopropylbenzene (Cumene)	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Methyl Acetate	100	U	100	2.4	10	NA	11/14/11 15:52		269539	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111110
Lab Code: R1106413-003

Service Request: R1106413
Date Collected: 11/10/11 1059
Date Received: 11/11/11
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Methylcyclohexane	100	U	100	2.5	10	NA	11/14/11 15:52		269539	
Styrene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Tetrachloroethene (PCE)	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Toluene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Trichloroethene (TCE)	2000		100	4.7	20	NA	11/14/11 16:51		269539	
Trichlorofluoromethane (CFC 11)	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
Vinyl Chloride	640		50	2.4	10	NA	11/14/11 15:52		269539	
cis-1,2-Dichloroethene	2000		100	4.0	20	NA	11/14/11 16:51		269539	
cis-1,3-Dichloropropene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
m,p-Xylenes	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
n-Butyl Acetate	50	U	50	2.1	10	NA	11/14/11 15:52		269539	
o-Xylene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	
trans-1,2-Dichloroethene	14	I	50	2.0	10	NA	11/14/11 15:52		269539	
trans-1,3-Dichloropropene	50	U	50	2.0	10	NA	11/14/11 15:52		269539	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	11/14/11 15:52	
Dibromofluoromethane	103	89-119	11/14/11 15:52	
Toluene-d8	106	87-121	11/14/11 15:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: 11/10/11 1059
Date Received: 11/11/11
Date Analyzed: 11/14/11 13:11

Sample Name: LC34-RW0008-052.0-20111110
Lab Code: R1106413-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1146.run

Analysis Lot: 269416
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	10		5.0	
74-85-1	Ethene	140		5.0	
74-82-8	Methane	450		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: 11/10/11 1059
Date Received: 11/11/11
Date Analyzed: 11/15/11 16:23

Sample Name: LC34-RW0008-052.0-20111110
Lab Code: R1106413-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\111511\X0006802.D\

Analysis Lot: 269617
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	120	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	22	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.4	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106413-MB

Service Request: R1106413
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	11/16/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	11/30/11 02:20	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	11/11/11 18:13	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	11/11/11 12:23	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	12/2/11 13:08	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	11/11/11 12:23	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	11/11/11 14:05	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	11/11/11 12:23	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	11/11/11 12:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106413-MB1

Service Request: R1106413
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 17:27	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/14/11	11/18/11 17:27	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 17:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106413-MB2

Service Request: R1106413
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 17:32	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/14/11	11/18/11 17:32	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	11/14/11	11/18/11 17:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/10/11
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: RQ1111758-01

Service Request: R1106413
 Date Collected: NA
 Date Received: NA
 Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	11/14/11 12:10		269539	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	11/14/11 12:10		269539	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	11/14/11 12:10		269539	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	11/14/11 12:10		269539	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	11/14/11 12:10		269539	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	11/14/11 12:10		269539	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	11/14/11 12:10		269539	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
n-Butanol	250	U	250	11	1	NA	11/14/11 12:10		269539	
2-Butanone (MEK)	10	U	10	0.51	1	NA	11/14/11 12:10		269539	
2-Hexanone	10	U	10	0.35	1	NA	11/14/11 12:10		269539	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	11/14/11 12:10		269539	
Acetone	10	U	10	0.98	1	NA	11/14/11 12:10		269539	
Benzene	5.0	U	5.0	0.21	1	NA	11/14/11 12:10		269539	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Bromoform	5.0	U	5.0	0.27	1	NA	11/14/11 12:10		269539	
Bromomethane	5.0	U	5.0	0.31	1	NA	11/14/11 12:10		269539	
Carbon Disulfide	10	U	10	0.20	1	NA	11/14/11 12:10		269539	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	11/14/11 12:10		269539	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Chloroethane	5.0	U	5.0	0.31	1	NA	11/14/11 12:10		269539	
Chloroform	5.0	U	5.0	0.22	1	NA	11/14/11 12:10		269539	
Chloromethane	5.0	U	5.0	0.24	1	NA	11/14/11 12:10		269539	
Cyclohexane	10	U	10	0.24	1	NA	11/14/11 12:10		269539	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	11/14/11 12:10		269539	
Dichloromethane	5.0	U	5.0	0.22	1	NA	11/14/11 12:10		269539	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Methyl Acetate	10	U	10	0.23	1	NA	11/14/11 12:10		269539	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1111758-01

Service Request: R1106413
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Methylcyclohexane	10	U	10	0.25	1	NA	11/14/11 12:10		269539	
Styrene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Toluene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	11/14/11 12:10		269539	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	11/14/11 12:10		269539	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	11/14/11 12:10		269539	
o-Xylene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	11/14/11 12:10		269539	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	11/14/11 12:10	
Dibromofluoromethane	100	89-119	11/14/11 12:10	
Toluene-d8	104	87-121	11/14/11 12:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: NA
Date Received: NA
Date Analyzed: 11/14/11 08:00

Sample Name: Method Blank
Lab Code: RQ1111629-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1131.run

Analysis Lot: 269416
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Collected: NA
Date Received: NA
Date Analyzed: 11/15/11 11:35

Sample Name: Method Blank
Lab Code: RQ1111686-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\111511\X0006797.D\

Analysis Lot: 269617
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/11/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106413-LCS1			Duplicate Lab Control Sample R1106413-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.76	6.8	99	6.80	6.8	100	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/11/11 -
 12/ 2/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106413-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.930	1.00	93	90 - 110
Chloride	300.0	1.98	2.00	99	90 - 110
Iodide	300.0	0.929	1.00	93	90 - 110
Nitrate as Nitrogen	300.0	0.991	1.00	99	90 - 110
Nitrite as Nitrogen	353.2	0.238	0.250	95	90 - 110
Sulfate	300.0	1.97	2.00	98	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.5	20.0	103	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.99	10.0	100	86 - 117

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/18/11

**Lab Control Sample Summary
 Inorganic Parameters**

Units: µg/L
Basis: NA

Lab Control Sample R1106413-LCS					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	6010C	42.2	40	106	80 - 120
Iron, Dissolved	6010C	1020	1000	102	80 - 120
Manganese, Dissolved	6010C	509	500	102	80 - 120

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/14/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 269539

Analyte Name	Lab Control Sample RQ1111758-02			Duplicate Lab Control Sample RQ1111758-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	17.8	20.0	89	19.3	20.0	97	72 - 128	8	30
1,1,2,2-Tetrachloroethane	19.8	20.0	99	22.1	20.0	110	72 - 131	11	30
1,1,2-Trichloroethane	18.8	20.0	94	20.6	20.0	103	80 - 122	9	30
1,1,2-Trichloro-1,2,2-trifluoroethane	17.5	20.0	87	18.5	20.0	93	68 - 136	6	30
1,1-Dichloroethane (1,1-DCA)	18.8	20.0	94	20.4	20.0	102	76 - 124	8	30
1,1-Dichloroethene (1,1-DCE)	17.0	20.0	85	18.3	20.0	92	72 - 129	8	30
1,2,4-Trichlorobenzene	18.6	20.0	93	19.4	20.0	97	70 - 133	4	30
1,2-Dibromo-3-chloropropane (DBCP)	19.6	20.0	98	21.3	20.0	107	62 - 131	9	30
1,2-Dibromoethane	19.2	20.0	96	20.9	20.0	104	78 - 125	9	30
1,2-Dichlorobenzene	18.7	20.0	94	20.9	20.0	105	79 - 124	11	30
1,2-Dichloroethane	18.7	20.0	94	20.6	20.0	103	73 - 127	10	30
1,2-Dichloropropane	19.2	20.0	96	20.4	20.0	102	80 - 123	6	30
1,3-Dichlorobenzene	19.0	20.0	95	20.5	20.0	103	78 - 124	8	30
1,4-Dichlorobenzene	19.0	20.0	95	20.3	20.0	102	78 - 123	6	30
n-Butanol	1110	1000	111	1100	1000	110	70 - 130	<1	30
2-Butanone (MEK)	20.3	20.0	102	19.7	20.0	98	60 - 133	3	30
2-Hexanone	19.4	20.0	97	20.1	20.0	101	61 - 131	3	30
4-Methyl-2-pentanone	19.6	20.0	98	19.8	20.0	99	61 - 132	<1	30
Acetone	19.5	20.0	98	19.4	20.0	97	54 - 139	<1	30
Benzene	18.2	20.0	91	19.9	20.0	100	78 - 121	9	30
Bromodichloromethane	19.5	20.0	98	21.3	20.0	106	80 - 125	8	30
Bromoform	22.8	20.0	114	25.0	20.0	125	68 - 130	9	30
Bromomethane	14.9	20.0	74	15.7	20.0	79	57 - 144	6	30
Carbon Disulfide	19.4	20.0	97	16.8	20.0	84	52 - 140	14	30
Carbon Tetrachloride	19.7	20.0	98	21.1	20.0	106	68 - 133	7	30
Chlorobenzene	18.8	20.0	94	20.4	20.0	102	80 - 121	8	30
Chloroethane	17.7	20.0	88	19.1	20.0	96	71 - 130	8	30
Chloroform	18.7	20.0	93	20.5	20.0	102	78 - 125	9	30
Chloromethane	16.1	20.0	81	17.2	20.0	86	61 - 138	6	30
Cyclohexane	19.8	20.0	99	20.4	20.0	102	57 - 126	3	30
Dibromochloromethane	21.0	20.0	105	22.7	20.0	113	78 - 133	7	30
Dichlorodifluoromethane (CFC 12)	17.4	20.0	87	18.9	20.0	94	45 - 159	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/14/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 269539

Analyte Name	Lab Control Sample RQ1111758-02			Duplicate Lab Control Sample RQ1111758-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	18.6	20.0	93	19.8	20.0	99	75 - 125	6	30
Ethylbenzene	18.8	20.0	94	20.1	20.0	100	78 - 123	7	30
Isopropylbenzene (Cumene)	20.0	20.0	100	21.7	20.0	108	73 - 133	8	30
Methyl Acetate	21.4	20.0	107	21.6	20.0	108	57 - 157	1	30
Methyl tert-Butyl Ether	18.0	20.0	90	19.2	20.0	96	75 - 126	7	30
Methylcyclohexane	20.1	20.0	100	21.0	20.0	105	61 - 125	4	30
Styrene	18.4	20.0	92	20.2	20.0	101	80 - 132	9	30
Tetrachloroethene (PCE)	18.6	20.0	93	19.7	20.0	99	72 - 131	6	30
Toluene	18.6	20.0	93	20.3	20.0	101	78 - 122	8	30
Trichloroethene (TCE)	17.8	20.0	89	19.6	20.0	98	74 - 127	10	30
Trichlorofluoromethane (CFC 11)	17.8	20.0	89	18.9	20.0	95	69 - 141	6	30
Vinyl Chloride	18.3	20.0	92	19.8	20.0	99	72 - 138	8	30
cis-1,2-Dichloroethene	19.1	20.0	95	20.5	20.0	103	78 - 122	7	30
cis-1,3-Dichloropropene	19.3	20.0	97	20.4	20.0	102	77 - 125	5	30
m,p-Xylenes	37.6	40.0	94	40.2	40.0	100	79 - 126	7	30
n-Butyl Acetate	19.8	20.0	99	20.5	20.0	102	31 - 144	4	30
o-Xylene	18.4	20.0	92	20.0	20.0	100	77 - 118	8	30
trans-1,2-Dichloroethene	18.3	20.0	91	19.3	20.0	97	75 - 121	6	30
trans-1,3-Dichloropropene	19.1	20.0	95	20.5	20.0	103	69 - 127	7	30

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/14/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 269416

Analyte Name	Lab Control Sample RQ1111629-02			Duplicate Lab Control Sample RQ1111629-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	25.6	26.0	98	24.4	26.0	94	56 - 148	5	30
Ethene	22.7	24.3	93	21.8	24.3	90	58 - 155	4	30
Methane	24.9	26.2	95	23.8	26.2	91	55 - 150	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/10/11
Sample Matrix: Water

Service Request: R1106413
Date Analyzed: 11/15/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 269617

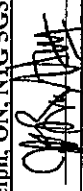
Analyte Name	Lab Control Sample RQ1111686-02			Duplicate Lab Control Sample RQ1111686-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.03	1.00	103	1.03	1.00	103	70 - 130	<1	30
Acetic Acid	9.55	10.0	96	9.51	10.0	95	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.97	10.0	100	10.2	10.0	102	78 - 113	2	30
Lactic Acid	8.93	9.97	90	8.99	9.97	90	61 - 109	<1	30
Propionic Acid	8.83	9.97	89	8.65	9.97	87	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: 

Number of Containers: _____
 VOCs (8260C) plus n-butyl acetate: _____
 VFAs (300): _____
 Bromide and Iodide with Anions (300.0): _____
 TOC (906A): _____
 Sulfide (906A): _____
 MEAs (RSK 175): _____
 Alkalinity (310.1): _____
 Dissolved Metals (6010B): _____

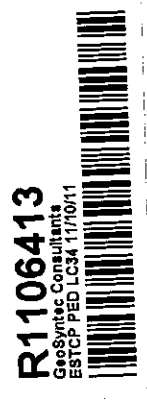
Sample I.D.	Date	Time	LAB ID	Matrix	REMARKS
LC34-RW0007-038.5-20111110	11/10/2011	1024	-001, 002	W	
LC34-RW0008-052.0-20111110	11/10/2011	1059	-002, 004	W	


TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____


REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: TR0272A

Comments/Special Instructions:
 Please filter dissolved metals in lab.



RELINQUISHED BY:
 Signature: 
 Printed Name: Cory Repta
 Firm: Geosyntec
 Date/Time: 11/10/11 - 1030

RECEIVED BY:
 Signature: 
 Printed Name: Amy DeStefano
 Firm: CAS
 Date/Time: 11/11/11 1001

Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R1106413

Cooler received on 11/11/11 by: AKH COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
 3. Did all bottles arrive in good condition (unbroken)? YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 5. Were Ice or Ice packs present? YES NO
 6. Where did the bottles originate? CAS/ROC CLIENT
 7. Temperature of cooler(s) upon receipt: 3.4°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 11/11/11 1025

Thermometer ID: IR GUN#3 (IR GUN#4) Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____
 PC Secondary Review: KB 11/11/11

Cooler Breakdown: Date: 11/11/11 Time: 11:11:1332 by: JH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 2. Did all bottle labels and tags agree with custody papers? YES NO
 3. Were correct containers used for the tests indicated? YES NO
 4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC1031388</u>	<u>8/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	<u>4/11/070</u>	<u>9/12</u>				

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust:

Bottle lot numbers: 091911-222, 1-087-002, 1-087-002, 1-132-001
 Other Comments: _____

PC Secondary Review: 12/11/11 KB

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

December 09, 2011

Service Request No: R1106658

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 11/22/11/ TR0272A

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on November 23, 2011. For your reference, these analyses have been assigned our service request number **R1106658**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 37

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 11/22/11
Sample Matrix: Water

Service Request No.: R1106658
Date Received: 11/23/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 11/22/11 and were received for analysis at Columbia Analytical Services from 11/10/11 via a national courier. The samples were received at a cooler temperature of 3.2°C within the guidelines of 0-6°C. No bottle breakage or vial headspace was noted upon sample receipt.

Volatile Organic Compounds GC & GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C and RSK 175.

Initial Calibration Criteria was met for all samples. The 8260C Continuing Calibration Verification (CCV) standard exceeded 20% difference for Acetone on 11/25/11. All detected concentrations for this compound in samples associated with this CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Extractable Organics

Two (2) samples were analyzed for Organic Acids by HPLC.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and Duplicate Laboratory Control Sample (DLCS) recoveries were all within QC limit. All Relative Percent Difference (RPD) calculations were acceptable.

Approved by  Date 12/7/11

00002

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Bromide, Iodide, Chloride, Nitrate, and Sulfate by IC method 300.0 and Nitrite by method 353.2. Two (2) water samples were analyzed for dissolved metals by ICP method 6010C. These soluble metals were filtered in the laboratory upon receipt of the samples.


All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All LCS recoveries were within acceptance limits. The LCS and LCSD for Sulfide were within QC limits. The Relative Percent Difference (RPD) calculation was acceptable.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Approved by  Date 12/9/4

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1106658

<u>Lab ID</u>	<u>Client ID</u>
R1106658-001	LC34-RW0007-038.5-20111122
R1106658-002	LC34-RW0007-038.5-20111122 Dissolved
R1106658-003	LC34-RW0008-052.0-20111122
R1106658-004	LC34-RW0008-052.0-20111122 Dissolved

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111122
Lab Code: R1106658-001

Service Request: R1106658
Date Collected: 11/22/11 1054
Date Received: 11/23/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	430		mg/L	2.0	1	NA	12/2/11 09:00	
Bromide	300.0	13.8		mg/L	1.0	10	NA	11/23/11 15:15	
Carbon, Total Organic (TOC), Average	9060A	174		mg/L	20	20	NA	11/30/11 17:08	
Chloride	300.0	469		mg/L	20	100	NA	12/1/11 00:47	
Iodide	300.0	10.6		mg/L	2.0	10	NA	12/2/11 14:05	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	11/23/11 15:15	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	11/23/11 12:49	
Sulfate	300.0	2.1		mg/L	2.0	10	NA	11/23/11 15:15	
Sulfide, Total	SM 4500-S2- F	17.7		mg/L	1.0	1	NA	11/23/11 14:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111122 Dissolved
Lab Code: R1106658-002

Service Request: R1106658
Date Collected: 11/22/11 1054
Date Received: 11/23/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/30/11	12/5/11 17:52	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/30/11	12/5/11 17:52	
Manganese, Dissolved	6010C	22		µg/L	10	1	11/30/11	12/5/11 17:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Collected: 11/22/11 1054
 Date Received: 11/23/11
 Date Analyzed: 11/25/11 19:48

Sample Name: LC34-RW0007-038.5-20111122
 Lab Code: R1106658-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\112511\112511.D6533.D\

Analysis Lot: 270945
 Instrument Name: R-MS-10
 Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13000	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	62 I	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	25000 U	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	1000 U	1000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	500 U	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: 11/22/11 1054
Date Received: 11/23/11
Date Analyzed: 11/25/11 19:48

Sample Name: LC34-RW0007-038.5-20111122
Lab Code: R1106658-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\112511\D6533.D\

Analysis Lot: 270945
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500 U	500	20	
79-20-9	Methyl Acetate	1000 U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500 U	500	20	
108-87-2	Methylcyclohexane	1000 U	1000	25	
100-42-5	Styrene	500 U	500	20	
127-18-4	Tetrachloroethene (PCE)	500 U	500	20	
108-88-3	Toluene	500 U	500	20	
79-01-6	Trichloroethene (TCE)	3200	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500 U	500	20	
75-01-4	Vinyl Chloride	4900	500	23	
156-59-2	cis-1,2-Dichloroethene	14000	500	20	
10061-01-5	cis-1,3-Dichloropropene	500 U	500	20	
179601-23-1	m,p-Xylenes	500 U	500	20	
123-86-4	n-Butyl Acetate	500 U	500	21	
95-47-6	o-Xylene	500 U	500	20	
156-60-5	trans-1,2-Dichloroethene	160 I	500	20	
10061-02-6	trans-1,3-Dichloropropene	500 U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	11/25/11 19:48	
Dibromofluoromethane	107	89-119	11/25/11 19:48	
Toluene-d8	101	87-121	11/25/11 19:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: 11/22/11 1054
Date Received: 11/23/11
Date Analyzed: 12/1/11 09:46

Sample Name: LC34-RW0007-038.5-20111122
Lab Code: R1106658-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1177.run

Analysis Lot: 271747
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	41		5.0	
74-85-1	Ethene	190		5.0	
74-82-8	Methane	510		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Collected: 11/22/11 1054
 Date Received: 11/23/11
 Date Analyzed: 12/6/11 00:33

Sample Name: LC34-RW0007-038.5-20111122
 Lab Code: R1106658-001

Units: mg/L
 Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
 Data File Name: J:\ACQU\DATA\HPLC05\DATA\120511\X0006926.D\

Analysis Lot: 271983
 Instrument Name: R-HPLC-05
 Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	1.0	U	1.0	
64-19-7	Acetic Acid	240		2.0	
107-92-6	Butanoic Acid (Butyric Acid)	170		4.0	
50-21-5	Lactic Acid	2.0	U	2.0	
79-09-4	Propionic Acid	12		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111122
Lab Code: R1106658-003

Service Request: R1106658
Date Collected: 11/22/11 1130
Date Received: 11/23/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	294		mg/L	2.0	1	NA	12/2/11 09:00	
Bromide	300.0	4.0		mg/L	1.0	10	NA	11/23/11 15:28	
Carbon, Total Organic (TOC), Average	9060A	56.0		mg/L	4.0	4	NA	11/30/11 17:48	
Chloride	300.0	620		mg/L	20	100	NA	12/1/11 02:16	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	12/2/11 14:13	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	11/23/11 15:28	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	11/23/11 12:52	
Sulfate	300.0	7.3		mg/L	2.0	10	NA	11/23/11 15:28	
Sulfide, Total	SM 4500-S2- F	15.0		mg/L	1.0	1	NA	11/23/11 14:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111122 Dissolved
Lab Code: R1106658-004

Service Request: R1106658
Date Collected: 11/22/11 1130
Date Received: 11/23/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/30/11	12/5/11 17:58	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/30/11	12/5/11 17:58	
Manganese, Dissolved	6010C	16		µg/L	10	1	11/30/11	12/5/11 17:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Collected: 11/22/11 1130
 Date Received: 11/23/11
 Date Analyzed: 11/25/11 20:18

Sample Name: LC34-RW0008-052.0-20111122
 Lab Code: R1106658-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\112511\11D6534.D\

Analysis Lot: 270945
 Instrument Name: R-MS-10
 Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	7.2 I	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	100 U	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	50 U	50	3.1	
75-15-0	Carbon Disulfide	100 U	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	50 U	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: 11/22/11 1130
Date Received: 11/23/11
Date Analyzed: 11/25/11 20:18

Sample Name: LC34-RW0008-052.0-20111122
Lab Code: R1106658-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\112511\VD6534.D\

Analysis Lot: 270945
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	1100		50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	580		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1600		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	12	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	11/25/11 20:18	
Dibromofluoromethane	106	89-119	11/25/11 20:18	
Toluene-d8	100	87-121	11/25/11 20:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: 11/22/11 1130
Date Received: 11/23/11
Date Analyzed: 12/1/11 09:57

Sample Name: LC34-RW0008-052.0-20111122
Lab Code: R1106658-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1178.run

Analysis Lot: 271747
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	10	5.0	
74-85-1	Ethene	190	5.0	
74-82-8	Methane	450	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: 11/22/11 1130
Date Received: 11/23/11
Date Analyzed: 12/5/11 21:43

Sample Name: LC34-RW0008-052.0-20111122
Lab Code: R1106658-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\120511\X0006923.D\

Analysis Lot: 271983
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	120	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	18	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.6	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: R1106658-MB1

Service Request: R1106658
 Date Collected: NA
 Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	12/2/11 09:00	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	11/23/11 14:48	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	11/30/11 14:29	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	11/30/11 20:45	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	12/2/11 13:08	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	11/23/11 14:48	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	11/23/11 12:48	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	11/23/11 14:48	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	11/23/11 14:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106658-MB2

Service Request: R1106658
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	0.20	U mg/L	0.20	1	NA	12/1/11 01:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106658-MB1

Service Request: R1106658
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	11/30/11	12/5/11 16:47	
Iron, Dissolved	6010C	100	U	µg/L	100	1	11/30/11	12/5/11 16:47	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	11/30/11	12/5/11 16:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water
 Sample Name: Method Blank
 Lab Code: R1106658-MB2

Service Request: R1106658
 Date Collected: NA
 Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	11/30/11	12/5/11 16:57	
Iron, Dissolved	6010C	100 U	µg/L	100	1	11/30/11	12/5/11 16:52	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	11/30/11	12/5/11 16:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1106658-MB3

Service Request: R1106658
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Iron, Dissolved	6010C	100 U	µg/L	100	1	11/30/11	12/5/11 16:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 11/25/11 13:21

Sample Name: Method Blank
 Lab Code: RQ1112385-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\112511\D6520.D\

Analysis Lot: 270945
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 11/25/11 13:21

Sample Name: Method Blank
 Lab Code: RQ1112385-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUADATA\msvoa10\data\112511\D6520.D\

Analysis Lot: 270945
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	11/25/11 13:21	
Dibromofluoromethane	102	89-119	11/25/11 13:21	
Toluene-d8	101	87-121	11/25/11 13:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: NA
Date Received: NA
Date Analyzed: 12/1/11 08:13

Sample Name: Method Blank
Lab Code: RQ1112396-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1171.run

Analysis Lot: 271747
Instrument Name: R-GC-02
Dilution Factor: 1

CA# No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Collected: NA
Date Received: NA
Date Analyzed: 12/5/11 13:13

Sample Name: Method Blank
Lab Code: RQ1112473-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\120511\X0006914.DA

Analysis Lot: 271983
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Analyzed: 11/23/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
 Basis: NA

Analyte Name	Method	Lab Control Sample R1106658-LCS1			Duplicate Lab Control Sample R1106658-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	6.17	5.5	112	6.25	5.5	113	56 - 138	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Analyzed: 11/23/11 -
 12/ 2/11

**Lab Control Sample Summary
 General Chemistry Parameters**

**Units: mg/L
 Basis: NA**

Analyte Name	Method	Lab Control Sample R1106658-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.956	1.00	96	90 - 110
Chloride	300.0	1.94	2.00	97	90 - 110
Iodide	300.0	0.929	1.00	93	90 - 110
Nitrate as Nitrogen	300.0	0.968	1.00	97	90 - 110
Nitrite as Nitrogen	353.2	0.238	0.250	95	90 - 110
Sulfate	300.0	1.96	2.00	98	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.8	20.0	99	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.67	10.0	97	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Analyzed: 12/ 1/11

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1106658-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Chloride	300.0	1.94	2.00	97	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Analyzed: 12/ 5/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1106658-LCS

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	6010C	41.7	40	104	80 - 120
Iron, Dissolved	6010C	1100	1000	110	80 - 120
Manganese, Dissolved	6010C	535	500	107	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Analyzed: 11/25/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 270945

**Lab Control Sample
 RQ1112385-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.1	20.0	96	72 - 128
1,1,2,2-Tetrachloroethane	18.5	20.0	92	72 - 131
1,1,2-Trichloroethane	19.1	20.0	96	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.8	20.0	94	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.8	20.0	99	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.6	20.0	93	72 - 129
1,2,4-Trichlorobenzene	18.7	20.0	93	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.2	20.0	96	62 - 131
1,2-Dibromoethane	19.4	20.0	97	78 - 125
1,2-Dichlorobenzene	19.5	20.0	98	79 - 124
1,2-Dichloroethane	19.5	20.0	98	73 - 127
1,2-Dichloropropane	19.6	20.0	98	80 - 123
1,3-Dichlorobenzene	19.9	20.0	99	78 - 124
1,4-Dichlorobenzene	19.3	20.0	96	78 - 123
n-Butanol	1090	1000	108	70 - 130
2-Butanone (MEK)	18.3	20.0	91	60 - 133
2-Hexanone	18.1	20.0	91	61 - 131
4-Methyl-2-pentanone	18.5	20.0	92	61 - 132
Acetone	19.0	20.0	95	54 - 139
Benzene	19.6	20.0	98	78 - 121
Bromodichloromethane	20.6	20.0	103	80 - 125
Bromoform	23.7	20.0	119	68 - 130
Bromomethane	16.1	20.0	80	57 - 144
Carbon Disulfide	21.2	20.0	106	52 - 140
Carbon Tetrachloride	22.4	20.0	112	68 - 133
Chlorobenzene	19.9	20.0	100	80 - 121
Chloroethane	19.0	20.0	95	71 - 130
Chloroform	19.9	20.0	100	78 - 125
Chloromethane	17.6	20.0	88	61 - 138
Cyclohexane	16.9	20.0	84	57 - 126
Dibromochloromethane	22.2	20.0	111	78 - 133
Dichlorodifluoromethane (CFC 12)	21.4	20.0	107	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Analyzed: 11/25/11

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 270945

**Lab Control Sample
 RQ1112385-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.4	20.0	97	75 - 125
Ethylbenzene	19.9	20.0	100	78 - 123
Isopropylbenzene (Cumene)	21.5	20.0	107	73 - 133
Methyl Acetate	19.3	20.0	96	57 - 157
Methyl tert-Butyl Ether	18.7	20.0	93	75 - 126
Methylcyclohexane	16.6	20.0	83	61 - 125
Styrene	19.7	20.0	99	80 - 132
Tetrachloroethene (PCE)	20.3	20.0	101	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	19.7	20.0	99	74 - 127
Trichlorofluoromethane (CFC 11)	18.3	20.0	92	69 - 141
Vinyl Chloride	18.8	20.0	94	72 - 138
cis-1,2-Dichloroethene	20.1	20.0	100	78 - 122
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	39.3	40.0	98	79 - 126
n-Butyl Acetate	17.4	20.0	87	31 - 144
o-Xylene	19.6	20.0	98	77 - 118
trans-1,2-Dichloroethene	19.2	20.0	96	75 - 121
trans-1,3-Dichloropropene	19.3	20.0	97	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 11/22/11/ TR0272A
Sample Matrix: Water

Service Request: R1106658
Date Analyzed: 12/ 1/11

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 271747

Lab Control Sample
RQ1112396-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	25.9	26.0	100	56 - 148
Ethene	22.6	24.3	93	58 - 155
Methane	26.0	26.2	99	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 11/22/11/ TR0272A
 Sample Matrix: Water

Service Request: R1106658
 Date Analyzed: 12/ 5/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
 Basis: NA

Analysis Lot: 271983

Analyte Name	Lab Control Sample RQ1112473-02			Duplicate Lab Control Sample RQ1112473-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.05	1.00	105	1.05	1.00	105	70 - 130	<1	30
Acetic Acid	9.76	10.0	98	9.65	10.0	97	70 - 135	1	30
Butanoic Acid (Butyric Acid)	9.60	10.0	96	9.59	10.0	96	78 - 113	<1	30
Lactic Acid	9.02	9.97	90	8.99	9.97	90	61 - 109	<1	30
Propionic Acid	8.96	9.97	90	8.60	9.97	86	80 - 125	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-2011 1122	11/22/11	1054	001 002	W	15	3	2	1	3	1	3	1	1	
LC34-RW0008-052.0-2011 1122	11/22/11	1130	003 004	W	15	3	2	1	3	1	3	1	1	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Jessica Partridge
 Firm: Geosyntec Consultants
 Date/Time: 11/22/11 - 1036

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Daniel Ward
 Firm: CAS
 Date/Time: 11/23/11 / 1005



Comments/Special Instructions:
 Please filter dissolved metals in lab.

Cooler Receipt And Preservation Check Form

Project/Client Geosintec Folder Number R11-6658

Cooler received on 11/23/11 by: Dfw COURIER: CAS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did ~~VOA~~ vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A*
5. Were ~~ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 3.2°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 11/23/11/1015

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: 11/28/11 KB

Cooler Breakdown: Date: 11/23/11 Time: 1347 by: DH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC1031381</u>	<u>8/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	<u>411100</u>					

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 1-132-001, 1091911-222, 1-087-002

Other Comments: * 1 vial for LC34-RW0008 CRSK

PC Secondary Review: DPath

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

January 04, 2012

Service Request No: R1107094

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272A 12/15/11

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on December 16, 2011. For your reference, these analyses have been assigned our service request number **R1107094**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Page 1 of 36

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 12/15/11
Sample Matrix: Water

Service Request No.: R1107094
Date Received: 12/16/11

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 12/15/11 and were received for analysis at Columbia Analytical Services from 12/16/11 via a national courier. The samples were received at a cooler temperature of 1.2°C within the guidelines of 0-6°C. No bottle breakage or vial headspace was noted upon sample receipt.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Volatile Organics GC

Two (2) samples were analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limit. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Approved by Kevin Berhe Date 1/4/12

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Bromide, Iodide, Chloride, Nitrate, and Sulfate by IC method 300.0 and Nitrite by method 353.2. Two (2) water samples were analyzed for dissolved metals by ICP method 6010C. These soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Batch QC is included in the report. All LCS recoveries were within acceptance limits. The LCS and LCSD for Sulfide were within QC limits. The Relative Percent Difference (RPD) calculation was acceptable.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Approved by Kevin Bender Date 1/4/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1107094

<u>Lab ID</u>	<u>Client ID</u>
R1107094-001	LC34-RW0007-038.5-20111215
R1107094-002	LC34-RW0007-038.5-20111215 Dissolved
R1107094-003	LC34-RW0008-052.0-20111215
R1107094-004	LC34-RW0008-052.0-20111215 Dissolved

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111215
Lab Code: R1107094-001

Service Request: R1107094
Date Collected: 12/15/11 10:26
Date Received: 12/16/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	455		mg/L	2.0	1	NA	12/20/11 09:10	
Bromide	300.0	13.1		mg/L	1.0	10	NA	12/16/11 19:32	
Carbon, Total Organic (TOC), Average	9060A	172		mg/L	20	20	NA	12/17/11 19:55	
Chloride	300.0	384		mg/L	20	100	NA	12/22/11 05:18	
Iodide	300.0	10.9		mg/L	2.0	10	NA	12/29/11 15:21	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	12/16/11 19:32	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	12/16/11 14:28	
Sulfate	300.0	4.3		mg/L	2.0	10	NA	12/16/11 19:32	
Sulfide, Total	SM 4500-S2- F	13.6		mg/L	1.0	1	NA	12/19/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111215 Dissolved
Lab Code: R1107094-002

Service Request: R1107094
Date Collected: 12/15/11 1026
Date Received: 12/16/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	12/21/11	12/27/11 17:54	
Iron, Dissolved	6010C	100	U	µg/L	100	1	12/21/11	12/27/11 17:54	
Manganese, Dissolved	6010C	15		µg/L	10	1	12/21/11	12/27/11 17:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: 12/15/11 10:26
Date Received: 12/16/11
Date Analyzed: 12/20/11 17:44

Sample Name: LC34-RW0007-038.5-20111215
Lab Code: R1107094-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\122011\D7137.D\

Analysis Lot: 273536
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7500	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	30 I	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	25000 U	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	1000 U	1000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	500 U	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: 12/15/11 10:26
Date Received: 12/16/11
Date Analyzed: 12/20/11 17:44

Sample Name: LC34-RW0007-038.5-20111215
Lab Code: R1107094-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\122011\VD7137.D\

Analysis Lot: 273536
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	1500		500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	6000		500	23	
156-59-2	cis-1,2-Dichloroethene	11000		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	500	U	500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	180	I	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	12/20/11 17:44	
Dibromofluoromethane	101	89-119	12/20/11 17:44	
Toluene-d8	105	87-121	12/20/11 17:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20111215
Lab Code: R1107094-001

Service Request: R1107094
Date Collected: 12/15/11 1026
Date Received: 12/16/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	46		5.0	5	NA	12/21/11 10:34		273910	
Ethene	300		5.0	5	NA	12/21/11 10:34		273910	
Methane	1100		50	25	NA	12/21/11 11:27		273910	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: 12/15/11 10:26
Date Received: 12/16/11
Date Analyzed: 12/28/11 16:26

Sample Name: LC34-RW0007-038.5-20111215
Lab Code: R1107094-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\122811\X0007152.D\

Analysis Lot: 274731
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	230	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	130	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	9.7	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111215
Lab Code: R1107094-003

Service Request: R1107094
Date Collected: 12/15/11 1101
Date Received: 12/16/11

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	321		mg/L	2.0	1	NA	12/20/11 09:10	
Bromide	300.0	5.3		mg/L	1.0	10	NA	12/16/11 19:45	
Carbon, Total Organic (TOC), Average	9060A	56.3		mg/L	4.0	4	NA	12/17/11 20:35	
Chloride	300.0	605		mg/L	20	100	NA	12/22/11 06:07	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	12/29/11 15:29	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	12/16/11 19:45	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	12/16/11 14:30	
Sulfate	300.0	7.0		mg/L	2.0	10	NA	12/16/11 19:45	
Sulfide, Total	SM 4500-S2- F	13.9		mg/L	1.0	1	NA	12/19/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111215 Dissolved
Lab Code: R1107094-004

Service Request: R1107094
Date Collected: 12/15/11 1101
Date Received: 12/16/11

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	12/21/11	12/27/11 17:59	
Iron, Dissolved	6010C	100 U	µg/L	100	1	12/21/11	12/27/11 17:59	
Manganese, Dissolved	6010C	12	µg/L	10	1	12/21/11	12/27/11 17:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A 12/15/11
 Sample Matrix: Water

Service Request: R1107094
 Date Collected: 12/15/11 1101
 Date Received: 12/16/11
 Date Analyzed: 12/20/11 18:14

Sample Name: LC34-RW0008-052.0-20111215
 Lab Code: R1107094-003

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\122011\07138.D\

Analysis Lot: 273536
 Instrument Name: R-MS-10
 Dilution Factor: 20

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100 U	100	4.7	
79-34-5	1,1,2,2-Tetrachloroethane	100 U	100	4.0	
79-00-5	1,1,2-Trichloroethane	100 U	100	4.7	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1700	100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100 U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	9.2 I	100	5.8	
120-82-1	1,2,4-Trichlorobenzene	100 U	100	5.2	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100 U	100	7.6	
106-93-4	1,2-Dibromoethane	100 U	100	4.0	
95-50-1	1,2-Dichlorobenzene	100 U	100	4.0	
107-06-2	1,2-Dichloroethane	100 U	100	4.0	
78-87-5	1,2-Dichloropropane	100 U	100	5.7	
541-73-1	1,3-Dichlorobenzene	100 U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100 U	100	4.0	
71-36-3	n-Butanol	5000 U	5000	210	
78-93-3	2-Butanone (MEK)	200 U	200	11	
591-78-6	2-Hexanone	200 U	200	7.0	
108-10-1	4-Methyl-2-pentanone	200 U	200	5.4	
67-64-1	Acetone	200 U	200	20	
71-43-2	Benzene	100 U	100	4.2	
75-27-4	Bromodichloromethane	100 U	100	4.0	
75-25-2	Bromoform	100 U	100	5.4	
74-83-9	Bromomethane	100 U	100	6.2	
75-15-0	Carbon Disulfide	200 U	200	4.0	
56-23-5	Carbon Tetrachloride	100 U	100	5.4	
108-90-7	Chlorobenzene	100 U	100	4.0	
75-00-3	Chloroethane	100 U	100	6.2	
67-66-3	Chloroform	100 U	100	4.4	
74-87-3	Chloromethane	100 U	100	4.8	
110-82-7	Cyclohexane	200 U	200	4.8	
124-48-1	Dibromochloromethane	100 U	100	4.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	100 U	100	12	
75-09-2	Dichloromethane	100 U	100	4.4	
100-41-4	Ethylbenzene	100 U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: 12/15/11 1101
Date Received: 12/16/11
Date Analyzed: 12/20/11 18:14

Sample Name: LC34-RW0008-052.0-20111215
Lab Code: R1107094-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDDATA\msvoa10\data\122011\D7138.D\

Analysis Lot: 273536
Instrument Name: R-MS-10
Dilution Factor: 20

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100 U	100	4.0	
79-20-9	Methyl Acetate	200 U	200	4.7	
1634-04-4	Methyl tert-Butyl Ether	100 U	100	4.0	
108-87-2	Methylcyclohexane	200 U	200	5.0	
100-42-5	Styrene	100 U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100 U	100	4.0	
108-88-3	Toluene	100 U	100	4.0	
79-01-6	Trichloroethene (TCE)	1500	100	4.7	
75-69-4	Trichlorofluoromethane (CFC 11)	100 U	100	4.0	
75-01-4	Vinyl Chloride	820	100	4.7	
156-59-2	cis-1,2-Dichloroethene	2300	100	4.0	
10061-01-5	cis-1,3-Dichloropropene	100 U	100	4.0	
179601-23-1	m,p-Xylenes	100 U	100	4.0	
123-86-4	n-Butyl Acetate	100 U	100	4.2	
95-47-6	o-Xylene	100 U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	17 I	100	4.0	
10061-02-6	trans-1,3-Dichloropropene	100 U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	12/20/11 18:14	
Dibromofluoromethane	103	89-119	12/20/11 18:14	
Toluene-d8	107	87-121	12/20/11 18:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20111215
Lab Code: R1107094-003

Service Request: R1107094
Date Collected: 12/15/11 1101
Date Received: 12/16/11
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	13		5.0	5	NA	12/21/11 10:58		273910	
Ethene	270		5.0	5	NA	12/21/11 10:58		273910	
Methane	600		20	10	NA	12/21/11 11:09		273910	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: 12/15/11 1101
Date Received: 12/16/11
Date Analyzed: 12/28/11 01:01

Sample Name: LC34-RW0008-052.0-20111215
Lab Code: R1107094-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\122711\X0007139.D\

Analysis Lot: 274561
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	120	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	13	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.6	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1107094-MB

Service Request: R1107094
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	12/20/11 09:10	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	12/16/11 18:55	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	12/17/11 09:19	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	12/22/11 03:57	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	12/29/11 15:05	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	12/16/11 18:55	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	12/16/11 14:25	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	12/16/11 18:55	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	12/19/11 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1107094-MB1

Service Request: R1107094
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	12/21/11	12/27/11 17:39	
Iron, Dissolved	6010C	100	U	µg/L	100	1	12/21/11	12/27/11 17:39	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	12/21/11	12/27/11 17:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1107094-MB2

Service Request: R1107094
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	12/21/11	12/27/11 17:44	
Iron, Dissolved	6010C	100	U	µg/L	100	1	12/21/11	12/27/11 17:44	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	12/21/11	12/27/11 17:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: NA
Date Received: NA
Date Analyzed: 12/20/11 11:16

Sample Name: Method Blank
Lab Code: RQ1113131-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\msvoa10\data\122011\D7124.D\

Analysis Lot: 273536
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: NA
Date Received: NA
Date Analyzed: 12/20/11 11:16

Sample Name: Method Blank
Lab Code: RQ1113131-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\122011\D7124.D\

Analysis Lot: 273536
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	12/20/11 11:16	
Dibromofluoromethane	102	89-119	12/20/11 11:16	
Toluene-d8	107	87-121	12/20/11 11:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: NA
Date Received: NA
Date Analyzed: 12/21/11 09:34

Sample Name: Method Blank
Lab Code: RQ1113084-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1369.run

Analysis Lot: 273910
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: NA
Date Received: NA
Date Analyzed: 12/27/11 12:33

Sample Name: Method Blank
Lab Code: RQ1113311-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\122711\X0007121.D\

Analysis Lot: 274561
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Collected: NA
Date Received: NA
Date Analyzed: 12/28/11 11:54

Sample Name: Method Blank
Lab Code: RQ1113359-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\122811\X0007144.D\

Analysis Lot: 274731
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/19/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1107094-LCS1			Duplicate Lab Control Sample R1107094-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.69	5.7	99	5.76	5.7	101	56 - 138	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/16/11 -
 12/29/11

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1107094-LCS2			
		Result	Spike Amount	% Rec	% Rec Limits
Bromide	300.0	1.04	1.00	104	90 - 110
Chloride	300.0	1.99	2.00	100	90 - 110
Iodide	300.0	0.993	1.00	99	90 - 110
Nitrate as Nitrogen	300.0	1.05	1.00	105	90 - 110
Nitrite as Nitrogen	353.2	0.241	0.250	96	90 - 110
Sulfate	300.0	2.10	2.00	105	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.0	20.0	100	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.86	10.0	99	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/27/11

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1107094-LCS

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	6010C	36.9	40	92	80 - 120
Iron, Dissolved	6010C	982	1000	98	80 - 120
Manganese, Dissolved	6010C	485	500	97	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A 12/15/11
 Sample Matrix: Water

Service Request: R1107094
 Date Analyzed: 12/20/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 273536

Lab Control Sample
 RQ1113131-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	14.8	20.0	74	72 - 128
1,1,2,2-Tetrachloroethane	20.2	20.0	101	72 - 131
1,1,2-Trichloroethane	17.8	20.0	89	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	14.0	20.0	70	68 - 136
1,1-Dichloroethane (1,1-DCA)	16.6	20.0	83	76 - 124
1,1-Dichloroethene (1,1-DCE)	14.9	20.0	75	72 - 129
1,2,4-Trichlorobenzene	19.3	20.0	96	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.1	20.0	85	62 - 131
1,2-Dibromoethane	17.9	20.0	89	78 - 125
1,2-Dichlorobenzene	18.8	20.0	94	79 - 124
1,2-Dichloroethane	20.1	20.0	100	73 - 127
1,2-Dichloropropane	18.3	20.0	92	80 - 123
1,3-Dichlorobenzene	18.3	20.0	92	78 - 124
1,4-Dichlorobenzene	19.0	20.0	95	78 - 123
n-Butanol	905	1000	90	70 - 130
2-Butanone (MEK)	19.3	20.0	97	60 - 133
2-Hexanone	21.1	20.0	106	61 - 131
4-Methyl-2-pentanone	19.5	20.0	98	61 - 132
Acetone	19.9	20.0	99	54 - 139
Benzene	17.4	20.0	87	78 - 121
Bromodichloromethane	18.1	20.0	90	80 - 125
Bromoform	17.8	20.0	89	68 - 130
Bromomethane	18.8	20.0	94	57 - 144
Carbon Disulfide	19.0	20.0	95	52 - 140
Carbon Tetrachloride	15.5	20.0	78	68 - 133
Chlorobenzene	17.2	20.0	86	80 - 121
Chloroethane	16.8	20.0	84	71 - 130
Chloroform	16.6	20.0	83	78 - 125
Chloromethane	19.6	20.0	98	61 - 138
Cyclohexane	22.6	20.0	113	57 - 126
Dibromochloromethane	17.6	20.0	88	78 - 133
Dichlorodifluoromethane (CFC 12)	15.6	20.0	78	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A 12/15/11
 Sample Matrix: Water

Service Request: R1107094
 Date Analyzed: 12/20/11

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 273536

Lab Control Sample
 RQ1113131-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	16.7	20.0	83	75 - 125
Ethylbenzene	16.3	20.0	81	78 - 123
Isopropylbenzene (Cumene)	18.7	20.0	94	73 - 133
Methyl Acetate	23.0	20.0	115	57 - 157
Methyl tert-Butyl Ether	16.9	20.0	84	75 - 126
Methylcyclohexane	19.8	20.0	99	61 - 125
Styrene	17.2	20.0	86	80 - 132
Tetrachloroethene (PCE)	17.6	20.0	88	72 - 131
Toluene	17.4	20.0	87	78 - 122
Trichloroethene (TCE)	15.8	20.0	79	74 - 127
Trichlorofluoromethane (CFC 11)	14.9	20.0	75	69 - 141
Vinyl Chloride	17.0	20.0	85	72 - 138
cis-1,2-Dichloroethene	16.4	20.0	82	78 - 122
cis-1,3-Dichloropropene	17.1	20.0	85	77 - 125
m,p-Xylenes	34.4	40.0	86	79 - 126
n-Butyl Acetate	21.3	20.0	107	31 - 144
o-Xylene	16.7	20.0	83	77 - 118
trans-1,2-Dichloroethene	15.1	20.0	76	75 - 121
trans-1,3-Dichloropropene	16.8	20.0	84	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/21/11

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 273910

Analyte Name	Lab Control Sample RQ1113084-02			Duplicate Lab Control Sample RQ1113084-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	29.2	26.0	112	27.4	26.0	105	56 - 148	7	30
Ethene	25.0	24.3	103	23.5	24.3	97	58 - 155	6	30
Methane	29.6	26.2	113	27.8	26.2	106	55 - 150	6	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/27/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 274561

Analyte Name	Lab Control Sample RQ1113311-02			Duplicate Lab Control Sample RQ1113311-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.900	1.00	90	0.930	1.00	93	70 - 130	3	30
Acetic Acid	9.79	10.0	98	9.78	10.0	98	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	8.77	10.0	88	10.5	10.0	105	78 - 113	18	30
Lactic Acid	9.10	9.97	91	9.04	9.97	91	61 - 109	<1	30
Propionic Acid	8.23	9.97	83	8.85	9.97	89	80 - 125	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A 12/15/11
Sample Matrix: Water

Service Request: R1107094
Date Analyzed: 12/28/11

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 274731

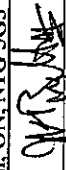
Analyte Name	Lab Control Sample RQ1113359-02			Duplicate Lab Control Sample RQ1113359-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.950	1.00	95	0.930	1.00	93	70 - 130	2	30
Acetic Acid	10.1	10.0	101	10.1	10.0	101	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	8.62	10.0	86	8.98	10.0	90	78 - 113	4	30
Lactic Acid	9.18	9.97	92	9.27	9.97	93	61 - 109	<1	30
Propionic Acid	9.41	9.97	94	9.08	9.97	91	80 - 125	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-3380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: 

Number of Containers _____
 VOCs (826C) plus n-butyl acetate 130/2
 VFAs (300) _____
 Bromide and Iodide with Anions (300.0) _____
 TOC (9060A) _____
 Sulfide (9060A) _____
 MEEs (RSK 175) _____
 Alkalinity (310.1) _____
 Dissolved Metals (6010B) _____

Sample I.D.	Date	Time	LAB ID	Matrix	REMARKS
LC34-RW0007-038.5-20111215	12/15/11	1026	-001,002	W	
LC34-RW0008-052.0-20111215	12/15/11	1101	-003,004	W	
LC34-FB-2011-001					

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results _____
 Requested Report Date: _____

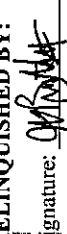
REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD? : NASA KEDD


Invoice Information
 P.O. # _____
 Bill to: TR0272A

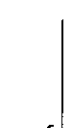
Comments/Special Instructions:
 Please filler dissolved metals in lab.


R1107094



RECEIVED BY:
 Signature:  Printed Name: Josiah Barnett
 Firm: Geosyntec Consultants Date/Time: 12/15/11 - 1630

RECEIVED BY:
 Signature:  Printed Name: _____
 Firm: _____ Date/Time: _____

RECEIVED BY:
 Signature:  Printed Name: Paula...
 Firm: _____ Date/Time: _____

RECEIVED BY:
 Signature:  Printed Name: Army Hentschko
 Firm: CAS Date/Time: 12/16/11 1020

Cooler Receipt And Preservation Check Form

Project/Client Geo Syntec Folder Number R1107094

Cooler received on 12/16/11 by: Adt COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
 3. Did all bottles arrive in good condition (unbroken)? YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 5. Were Ice or Ice packs present? YES NO
 6. Where did the bottles originate? CAS/ROC CLIENT
 7. Temperature of cooler(s) upon receipt: 1.2°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 12/16/11 1029

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 12/16/11

Cooler Breakdown: Date: 12/16/11 Time: 1243 by: Adt

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH			<u>WC103138C</u>	<u>8/12</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC103138D</u>	<u>8/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103098C</u>	<u>5/12</u>				
	HCl	*	*	<u>4111010</u>	<u>9/12</u>				

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 091911-2LL, 072511-2DD, +194-002, 1-187-002

Other Comments: _____

PC Secondary Review: KB 1/4/12

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

January 23, 2012

Service Request No: R1200102

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 TR0272A

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on January 6, 2012. For your reference, these analyses have been assigned our service request number **R1200102**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.



Karen Bunker
Project Manager

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 1/5/12
Sample Matrix: Water

Service Request No.: R1200102
Date Received: 1/6/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples and one (1) Trip Blank were collected by the client on 1/5/12 and were received for analysis at Columbia Analytical Services on 1/6/12 via a national courier. The samples were received at a cooler temperature of 3.6°C within the guidelines of 0-6°C. Sample vials received from CAS were preserved with HCL. The client triple rinsed the vials prior to sampling.

Organic Compounds

Two (2) water samples and one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial Calibration Criteria was met for all samples for 8260C. The Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Cyclohexane on 1/9/12. All detected concentrations for this compound in samples associated with this CCV should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD), (RSK & Organic Acids) recoveries were all within QC limits except for Cyclohexane which was outside limits high on the 1/9/12 and 1/12/12 runs. The exceedences are flagged as “*”. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as “I”, estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Approved by Shawn Burlew Date 1/23/12

Batch QC is included in the report. All LCS and LCSD (Sulfide) recoveries were within QC limits.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by Kevin Bender Date 1/23/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1200102

<u>Lab ID</u>	<u>Client ID</u>
R1200102-001	LC34-RW0007-038.5-20120105
R1200102-002	LC34-RW0007-038.5-20120105 Dissolved
R1200102-003	LC34-RW0008-052.0-20120105
R1200102-004	LC34-RW0008-052.0-20120105 Dissolved
R1200102-005	LC34-TB-20120105

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120105
Lab Code: R1200102-001

Service Request: R1200102
Date Collected: 1/ 5/12 0959
Date Received: 1/ 6/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	460		mg/L	2.0	1	NA	1/9/12 12:30	
Bromide	300.0	7.3		mg/L	1.0	10	NA	1/6/12 12:59	
Carbon, Total Organic (TOC), Average	9060A	153		mg/L	10	10	NA	1/10/12 15:41	
Chloride	300.0	199		mg/L	10	50	NA	1/9/12 16:03	
Iodide	300.0	12.4		mg/L	2.0	10	NA	1/19/12 16:04	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	1/6/12 12:59	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	1/6/12 12:26	
Sulfate	300.0	3.7		mg/L	2.0	10	NA	1/6/12 12:59	
Sulfide, Total	SM 4500-S2- F	13.5		mg/L	1.0	1	NA	1/6/12 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120105 Dissolved
Lab Code: R1200102-002

Service Request: R1200102
Date Collected: 1/ 5/12 0959
Date Received: 1/ 6/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	1/ 9/12	1/10/12 19:54	
Iron, Dissolved	6010C	100 U	µg/L	100	1	1/ 9/12	1/10/12 19:54	
Manganese, Dissolved	6010C	19	µg/L	10	1	1/ 9/12	1/10/12 19:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A
 Sample Matrix: Water

Service Request: R1200102
 Date Collected: 1/ 5/12 0959
 Date Received: 1/ 6/12
 Date Analyzed: 1/12/12 13:24

Sample Name: LC34-RW0007-038.5-20120105
 Lab Code: R1200102-001

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\011212\D7590.D\

Analysis Lot: 276160
 Instrument Name: R-MS-10
 Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2600	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250 U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	19	
106-93-4	1,2-Dibromoethane	250 U	250	10	
95-50-1	1,2-Dichlorobenzene	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	15	
541-73-1	1,3-Dichlorobenzene	250 U	250	10	
106-46-7	1,4-Dichlorobenzene	250 U	250	10	
71-36-3	n-Butanol	13000 U	13000	530	
78-93-3	2-Butanone (MEK)	500 U	500	26	
591-78-6	2-Hexanone	500 U	500	18	
108-10-1	4-Methyl-2-pentanone	500 U	500	14	
67-64-1	Acetone	500 U	500	49	
71-43-2	Benzene	250 U	250	11	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	14	
74-83-9	Bromomethane	250 U	250	16	
75-15-0	Carbon Disulfide	500 U	500	10	
56-23-5	Carbon Tetrachloride	250 U	250	14	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	16	
67-66-3	Chloroform	250 U	250	11	
74-87-3	Chloromethane	250 U	250	12	
110-82-7	Cyclohexane	500 U	500	12	
124-48-1	Dibromochloromethane	250 U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250 U	250	29	
75-09-2	Dichloromethane	250 U	250	11	
100-41-4	Ethylbenzene	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: 1/ 5/12 0959
Date Received: 1/ 6/12
Date Analyzed: 1/12/12 13:24

Sample Name: LC34-RW0007-038.5-20120105
Lab Code: R1200102-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\011212\D7590.D\

Analysis Lot: 276160
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250 U	250	10	
79-20-9	Methyl Acetate	500 U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250 U	250	10	
108-87-2	Methylcyclohexane	500 U	500	13	
100-42-5	Styrene	250 U	250	10	
127-18-4	Tetrachloroethene (PCE)	250 U	250	10	
108-88-3	Toluene	250 U	250	10	
79-01-6	Trichloroethene (TCE)	160 I	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250 U	250	10	
75-01-4	Vinyl Chloride	6200	250	12	
156-59-2	cis-1,2-Dichloroethene	4500	250	10	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	10	
179601-23-1	m,p-Xylenes	250 U	250	10	
123-86-4	n-Butyl Acetate	250 U	250	11	
95-47-6	o-Xylene	250 U	250	10	
156-60-5	trans-1,2-Dichloroethene	200 I	250	10	
10061-02-6	trans-1,3-Dichloropropene	250 U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	1/12/12 13:24	
Dibromofluoromethane	102	89-119	1/12/12 13:24	
Toluene-d8	104	87-121	1/12/12 13:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120105
Lab Code: R1200102-001

Service Request: R1200102
Date Collected: 1/ 5/12 0959
Date Received: 1/ 6/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	30		5.0	5	NA	1/10/12 09:48		275796	
Ethene	740		50	50	NA	1/10/12 10:33		275796	
Methane	3200		100	50	NA	1/10/12 10:33		275796	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: 1/ 5/12 0959
Date Received: 1/ 6/12
Date Analyzed: 1/12/12 03:30

Sample Name: LC34-RW0007-038.5-20120105
Lab Code: R1200102-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\011112\X0007254.D\

Analysis Lot: 276105
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	2.5	U	2.5	
64-19-7	Acetic Acid	220		5.0	
107-92-6	Butanoic Acid (Butyric Acid)	54		10	
50-21-5	Lactic Acid	5.0	U	5.0	
79-09-4	Propionic Acid	8.9		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120105
Lab Code: R1200102-003

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	314	mg/L	2.0	1	NA	1/9/12 12:30	
Bromide	300.0	4.5	mg/L	1.0	10	NA	1/6/12 13:15	
Carbon, Total Organic (TOC), Average	9060A	50.9	mg/L	4.0	4	NA	1/10/12 16:21	
Chloride	300.0	679	mg/L	20	100	NA	1/9/12 19:56	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	1/19/12 16:12	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	1/6/12 13:15	
Nitrite as Nitrogen	353.2	0.010 U	mg/L	0.010	1	NA	1/6/12 12:29	
Sulfate	300.0	3.9	mg/L	2.0	10	NA	1/6/12 13:15	
Sulfide, Total	SM 4500-S2- F	13.5	mg/L	1.0	1	NA	1/6/12 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120105 Dissolved
Lab Code: R1200102-004

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	1/ 9/12	1/10/12 19:58	
Iron, Dissolved	6010C	100 U	µg/L	100	1	1/ 9/12	1/10/12 19:58	
Manganese, Dissolved	6010C	15	µg/L	10	1	1/ 9/12	1/10/12 19:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12
Date Analyzed: 1/9/12 17:28

Sample Name: LC34-RW0008-052.0-20120105
Lab Code: R1200102-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\010912\D7548.D\

Analysis Lot: 275740
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.4 I	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	100 U	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	50 U	50	3.1	
75-15-0	Carbon Disulfide	100 U	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	50 U	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12
Date Analyzed: 1/9/12 17:28

Sample Name: LC34-RW0008-052.0-20120105
Lab Code: R1200102-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\010912\D7548.D\

Analysis Lot: 275740
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50 U	50	2.0	
79-20-9	Methyl Acetate	100 U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50 U	50	2.0	
108-87-2	Methylcyclohexane	100 U	100	2.5	
100-42-5	Styrene	50 U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50 U	50	2.0	
108-88-3	Toluene	50 U	50	2.0	
79-01-6	Trichloroethene (TCE)	1100	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50 U	50	2.0	
75-01-4	Vinyl Chloride	560	50	2.4	
156-59-2	cis-1,2-Dichloroethene	1400	50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50 U	50	2.0	
179601-23-1	m,p-Xylenes	50 U	50	2.0	
123-86-4	n-Butyl Acetate	50 U	50	2.1	
95-47-6	o-Xylene	50 U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	12 I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50 U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	1/9/12 17:28	
Dibromofluoromethane	106	89-119	1/9/12 17:28	
Toluene-d8	106	87-121	1/9/12 17:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120105
Lab Code: R1200102-003

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	13		5.0	5	NA	1/10/12 09:58		275796	
Ethene	320		5.0	5	NA	1/10/12 09:58		275796	
Methane	670		20	10	NA	1/10/12 10:10		275796	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120105
Lab Code: R1200102-003

Service Request: R1200102
Date Collected: 1/ 5/12 1041
Date Received: 1/ 6/12
Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Pyruvic Acid	0.50	U	0.50	1	NA	1/17/12 02:39		276606	
Acetic Acid	96		1.0	1	NA	1/17/12 02:39		276606	
Butanoic Acid (Butyric Acid)	8.5		2.0	1	NA	1/17/12 02:39		276606	
Lactic Acid	1.0	U	1.0	1	NA	1/17/12 02:39		276606	
Propionic Acid	1.4		1.0	1	NA	1/17/12 02:39		276606	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A
 Sample Matrix: Water

Service Request: R1200102
 Date Collected: 1/ 5/12
 Date Received: 1/ 6/12
 Date Analyzed: 1/9/12 16:28

Sample Name: LC34-TB-20120105
 Lab Code: R1200102-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa10\data\010912\D7546.D\

Analysis Lot: 275740
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: 1/ 5/12
Date Received: 1/ 6/12
Date Analyzed: 1/9/12 16:28

Sample Name: LC34-TB-20120105
Lab Code: R1200102-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\010912\07546.D\

Analysis Lot: 275740
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	1/9/12 16:28	
Dibromofluoromethane	105	89-119	1/9/12 16:28	
Toluene-d8	104	87-121	1/9/12 16:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200102-MB

Service Request: R1200102
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	1/9/12 12:30	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	1/6/12 11:22	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	1/10/12 13:41	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	1/9/12 15:10	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	1/19/12 15:47	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	1/6/12 11:22	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	1/6/12 12:25	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	1/6/12 11:22	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	1/6/12 11:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200102-MB1

Service Request: R1200102
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	1/ 9/12	1/10/12 17:25	
Iron, Dissolved	6010C	100	U	µg/L	100	1	1/ 9/12	1/10/12 17:25	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	1/ 9/12	1/10/12 17:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200102-MB2

Service Request: R1200102
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	1/ 9/12	1/10/12 17:29	
Iron, Dissolved	6010C	100 U	µg/L	100	1	1/ 9/12	1/10/12 17:29	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	1/ 9/12	1/10/12 17:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A
 Sample Matrix: Water

Service Request: R1200102
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 1/9/12 11:18

Sample Name: Method Blank
 Lab Code: RQ1200294-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\010912\D7536.D\

Analysis Lot: 275740
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: NA
Date Received: NA
Date Analyzed: 1/9/12 11:18

Sample Name: Method Blank
Lab Code: RQ1200294-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\010912\D7536.D\

Analysis Lot: 275740
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	1/9/12 11:18	
Dibromofluoromethane	104	89-119	1/9/12 11:18	
Toluene-d8	105	87-121	1/9/12 11:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A
 Sample Matrix: Water

Service Request: R1200102
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 1/12/12 12:17

Sample Name: Method Blank
 Lab Code: RQ1200440-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\011212\D7588.D\

Analysis Lot: 276160
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Collected: NA
Date Received: NA
Date Analyzed: 1/12/12 12:17

Sample Name: Method Blank
Lab Code: RQ1200440-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\011212\D7588.D\

Analysis Lot: 276160
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	1/12/12 12:17	
Dibromofluoromethane	101	89-119	1/12/12 12:17	
Toluene-d8	104	87-121	1/12/12 12:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1200215-01

Service Request: R1200102
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	1.0	U	1.0	1	NA	1/10/12 09:13		275796	
Ethene	1.0	U	1.0	1	NA	1/10/12 09:13		275796	
Methane	2.0	U	2.0	1	NA	1/10/12 09:13		275796	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1200302-01

Service Request: R1200102
Date Collected: NA
Date Received: NA
Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Pyruvic Acid	0.50	U	0.50	1	NA	1/12/12 01:25		276105	
Acetic Acid	1.0	U	1.0	1	NA	1/12/12 01:25		276105	
Butanoic Acid (Butyric Acid)	2.0	U	2.0	1	NA	1/12/12 01:25		276105	
Lactic Acid	1.0	U	1.0	1	NA	1/12/12 01:25		276105	
Propionic Acid	1.0	U	1.0	1	NA	1/12/12 01:25		276105	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1200438-01

Service Request: R1200102
Date Collected: NA
Date Received: NA
Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Pyruvic Acid	0.50	U	0.50	1	NA	1/16/12 10:43		276606	
Acetic Acid	1.0	U	1.0	1	NA	1/16/12 10:43		276606	
Butanoic Acid (Butyric Acid)	2.0	U	2.0	1	NA	1/16/12 10:43		276606	
Lactic Acid	1.0	U	1.0	1	NA	1/16/12 10:43		276606	
Propionic Acid	1.0	U	1.0	1	NA	1/16/12 10:43		276606	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/ 6/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1200102-LCS1			Duplicate Lab Control Sample R1200102-DLCS1			% Rec Limits	RPD	RPD.. Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.70	5.5	105	5.68	5.5	104	56 - 138	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/ 6/12 -
 1/19/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1200102-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.994	1.00	99	90 - 110
Chloride	300.0	2.04	2.00	102	90 - 110
Iodide	300.0	1.02	1.00	102	90 - 110
Nitrate as Nitrogen	300.0	1.00	1.00	100	90 - 110
Nitrite as Nitrogen	353.2	0.239	0.250	96	90 - 110
Sulfate	300.0	1.92	2.00	96	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	21.0	20.0	105	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.98	10.0	100	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/10/12

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1200102-LCS

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	37.1	40	93	80 - 120
Iron, Dissolved	6010C	979	1000	98	80 - 120
Manganese, Dissolved	6010C	487	500	97	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 TR0272A
 Sample Matrix: Water

Service Request: R1200102
 Date Analyzed: 1/9/12

Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
 Basis: NA

Analysis Lot: 275740

Lab Control Sample
 RQ1200294-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.2	20.0	86	72 - 128
1,1,2,2-Tetrachloroethane	18.5	20.0	93	72 - 131
1,1,2-Trichloroethane	20.0	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.7	20.0	89	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.1	20.0	90	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.2	20.0	86	72 - 129
1,2,4-Trichlorobenzene	21.3	20.0	106	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.4	20.0	87	62 - 131
1,2-Dibromoethane	19.8	20.0	99	78 - 125
1,2-Dichlorobenzene	20.6	20.0	103	79 - 124
1,2-Dichloroethane	22.5	20.0	113	73 - 127
1,2-Dichloropropane	19.7	20.0	98	80 - 123
1,3-Dichlorobenzene	20.3	20.0	102	78 - 124
1,4-Dichlorobenzene	20.5	20.0	103	78 - 123
n-Butanol	838	1000	83	70 - 130
2-Butanone (MEK)	18.1	20.0	90	60 - 133
2-Hexanone	20.5	20.0	102	61 - 131
4-Methyl-2-pentanone	19.2	20.0	96	61 - 132
Acetone	19.0	20.0	95	54 - 139
Benzene	20.2	20.0	101	78 - 121
Bromodichloromethane	20.1	20.0	100	80 - 125
Bromoform	21.3	20.0	106	68 - 130
Bromomethane	23.9	20.0	119	57 - 144
Carbon Disulfide	18.0	20.0	90	52 - 140
Carbon Tetrachloride	20.0	20.0	100	68 - 133
Chlorobenzene	20.5	20.0	103	80 - 121
Chloroethane	18.3	20.0	91	71 - 130
Chloroform	18.5	20.0	93	78 - 125
Chloromethane	22.2	20.0	111	61 - 138
Cyclohexane	26.8	20.0	134 *	57 - 126
Dibromochloromethane	20.3	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	17.2	20.0	86	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/ 9/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 275740

**Lab Control Sample
 RQ1200294-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.9	20.0	90	75 - 125
Ethylbenzene	19.8	20.0	99	78 - 123
Isopropylbenzene (Cumene)	22.5	20.0	112	73 - 133
Methyl Acetate	21.9	20.0	109	57 - 157
Methyl tert-Butyl Ether	16.9	20.0	84	75 - 126
Methylcyclohexane	22.0	20.0	110	61 - 125
Styrene	19.3	20.0	96	80 - 132
Tetrachloroethene (PCE)	22.8	20.0	114	72 - 131
Toluene	20.3	20.0	102	78 - 122
Trichloroethene (TCE)	19.9	20.0	99	74 - 127
Trichlorofluoromethane (CFC 11)	18.6	20.0	93	69 - 141
Vinyl Chloride	18.8	20.0	94	72 - 138
cis-1,2-Dichloroethene	18.1	20.0	90	78 - 122
cis-1,3-Dichloropropene	18.4	20.0	92	77 - 125
m,p-Xylenes	40.5	40.0	101	79 - 126
n-Butyl Acetate	20.1	20.0	100	31 - 144
o-Xylene	19.7	20.0	98	77 - 118
trans-1,2-Dichloroethene	17.8	20.0	89	75 - 121
trans-1,3-Dichloropropene	18.1	20.0	90	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/12/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 276160

Lab Control Sample

RQ1200440-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.7	20.0	88	72 - 128
1,1,2,2-Tetrachloroethane	19.6	20.0	98	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.1	20.0	96	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.8	20.0	99	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.5	20.0	92	72 - 129
1,2,4-Trichlorobenzene	22.4	20.0	112	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.7	20.0	89	62 - 131
1,2-Dibromoethane	20.8	20.0	104	78 - 125
1,2-Dichlorobenzene	20.7	20.0	103	79 - 124
1,2-Dichloroethane	21.6	20.0	108	73 - 127
1,2-Dichloropropane	20.7	20.0	104	80 - 123
1,3-Dichlorobenzene	20.4	20.0	102	78 - 124
1,4-Dichlorobenzene	21.0	20.0	105	78 - 123
n-Butanol	860	1000	86	70 - 130
2-Butanone (MEK)	18.8	20.0	94	60 - 133
2-Hexanone	19.3	20.0	97	61 - 131
4-Methyl-2-pentanone	18.5	20.0	92	61 - 132
Acetone	17.4	20.0	87	54 - 139
Benzene	21.3	20.0	106	78 - 121
Bromodichloromethane	19.8	20.0	99	80 - 125
Bromoform	20.5	20.0	103	68 - 130
Bromomethane	23.8	20.0	119	57 - 144
Carbon Disulfide	18.9	20.0	94	52 - 140
Carbon Tetrachloride	18.8	20.0	94	68 - 133
Chlorobenzene	21.4	20.0	107	80 - 121
Chloroethane	18.9	20.0	94	71 - 130
Chloroform	19.1	20.0	95	78 - 125
Chloromethane	22.3	20.0	111	61 - 138
Cyclohexane	25.7	20.0	129 *	57 - 126
Dibromochloromethane	20.0	20.0	100	78 - 133
Dichlorodifluoromethane (CFC 12)	16.9	20.0	85	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/12/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 276160

**Lab Control Sample
 RQ1200440-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.0	20.0	100	75 - 125
Ethylbenzene	20.9	20.0	105	78 - 123
Isopropylbenzene (Cumene)	23.0	20.0	115	73 - 133
Methyl Acetate	22.3	20.0	112	57 - 157
Methyl tert-Butyl Ether	18.0	20.0	90	75 - 126
Methylcyclohexane	21.1	20.0	106	61 - 125
Styrene	19.8	20.0	99	80 - 132
Tetrachloroethene (PCE)	23.3	20.0	116	72 - 131
Toluene	21.0	20.0	105	78 - 122
Trichloroethene (TCE)	20.6	20.0	103	74 - 127
Trichlorofluoromethane (CFC 11)	18.7	20.0	93	69 - 141
Vinyl Chloride	19.7	20.0	98	72 - 138
cis-1,2-Dichloroethene	19.7	20.0	99	78 - 122
cis-1,3-Dichloropropene	19.1	20.0	95	77 - 125
m,p-Xylenes	42.4	40.0	106	79 - 126
n-Butyl Acetate	19.4	20.0	97	31 - 144
o-Xylene	20.3	20.0	101	77 - 118
trans-1,2-Dichloroethene	19.2	20.0	96	75 - 121
trans-1,3-Dichloropropene	18.5	20.0	93	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/10/12

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 275796

Analyte Name	Lab Control Sample RQ1200215-02			Duplicate Lab Control Sample RQ1200215-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.1	26.0	100	24.7	26.0	95	56 - 148	6	30
Ethene	22.3	24.3	92	21.2	24.3	87	58 - 155	5	30
Methane	26.6	26.2	101	25.2	26.2	96	55 - 150	5	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/12/12

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 276105

Analyte Name	Lab Control Sample RQ1200302-02			Duplicate Lab Control Sample RQ1200302-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.820	0.991	83	0.810	0.991	82	70 - 130	1	30
Acetic Acid	8.53	10.3	83	8.78	10.3	86	70 - 135	3	30
Butanoic Acid (Butyric Acid)	9.41	10.1	93	9.19	10.1	91	78 - 113	2	30
Lactic Acid	8.61	10.0	86	8.66	10.0	87	61 - 109	<1	30
Propionic Acid	8.33	9.93	84	8.54	9.93	86	80 - 125	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 TR0272A
Sample Matrix: Water

Service Request: R1200102
Date Analyzed: 1/16/12

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 276606

Analyte Name	Lab Control Sample RQ1200438-02			Duplicate Lab Control Sample RQ1200438-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.880	0.991	89	0.900	0.991	91	70 - 130	2	30
Acetic Acid	9.82	10.3	96	9.90	10.3	97	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	9.55	10.1	94	9.83	10.1	97	78 - 113	3	30
Lactic Acid	9.68	10.0	97	9.71	10.0	97	61 - 109	<1	30
Propionic Acid	9.03	9.93	91	9.77	9.93	98	80 - 125	8	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH.585-288-5380 FAX.585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:
 Sampler's Signature: *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-201110105	1/5/12	0959	001.002	W
LC34-RW0008-052.0-201110105	1/5/12	1041	003.004	W
LC34-TB-201110105	NA	NA	-005	

	Analysis Requested						REMARKS	
	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (906A)	Sulfide (906A)	MEEs (RSK 175)		Alkalinity (310.J)
	15	3	2	1	3	1	1	1
	15	3	2	1	3	1	1	1


Number of Containers: _____

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

Comments/Special Instructions:
 - Please filter dissolved metals in lab.
 - VOC (8260C) plus nBA sample bottles triple rinsed in field to remove preservative (HCl).

RECEIVED BY: *[Signature]*
 Signature: _____
 Printed Name: JOSEPH BARTUCCI
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/5/12 - 1030

R1200102
 Geosyntec Consultants
 ESTCP PED LC34 TR0272A


RELINQUISHED BY: *[Signature]*
 Signature: _____
 Printed Name: JOSEPH BARTUCCI
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/5/12 - 1030

RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: JOSEPH BARTUCCI
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/5/12 - 1030

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: JOSEPH BARTUCCI
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/5/12 - 1030

RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: JOSEPH BARTUCCI
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/5/12 - 1030

Cooler Receipt And Preservation Check Form

Project/Client GENUINETEL Folder Number R1100102

Cooler received on 11/6/12 by: JL COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
 2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
 3. Did all bottles arrive in good condition (unbroken)? YES NO
 4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 5. Were Ice or Ice packs present? YES NO
 6. Where did the bottles originate? CAS/ROC CLIENT
 7. Temperature of cooler(s) upon receipt: 5.6 _____
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 11/6/12 1008

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 11/6/12

Cooler Breakdown: Date: 11/6/12 Time: 11:31 by: dh

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC 1031436</u>	<u>11/12</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-						
	Zn Aceta	-	-						
	HCl	*	*	<u>411 1010</u>	<u>12/12</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet

Bottle lot numbers: 1-194-001, 1-194-002, V2250211

Other Comments: _____

PC Secondary Review: KB 11/23/12

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



February 13, 2012

Service Request No: R1200577

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 1/26/12

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on January 27, 2012. For your reference, these analyses have been assigned our service request number **R1200577**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

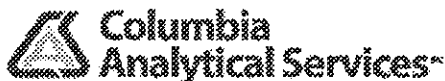
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 43



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

www.caslab.com

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KEEP SOLUTIONS FROM PARTING

00001

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1200577

<u>Lab ID</u>	<u>Client ID</u>
R1200577-001	LC34-RW0007-038.5-20120126
R1200577-002	LC34-RW0007-038.5-20120126 Dissolved
R1200577-003	LC34-RW0008-052.0-20120126
R1200577-004	LC34-RW0008-052.0-20120126 Dissolved
R1200577-005	LC34-TB-20120126

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 1/26/12
Sample Matrix: Water

Service Request No.: R1200577
Date Received: 1/27/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples and one (1) Trip Blank were collected by the client on 1/26/12 and were received for analysis at Columbia Analytical Services on 1/27/12 via a national courier. The samples were received at a cooler temperature of 3.5°C within the guidelines of 0-6°C.

Organic Compounds

Two (2) water samples and one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. Two (2) samples were also analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial Calibration Criteria was met for all samples for 8260C. The Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Carbon Disulfide on the 1/30/12 analytical run and n-Butanol, Bromoform, Dibromochloromethane and n-butyl acetate on the 2/1/12 run. All detected concentrations for these compound in samples associated with these CCV's should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicates (LCSD for Organic Acids only) recoveries were all within QC limits. The Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

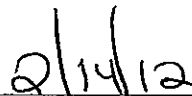
Two (2) water samples were analyzed for Bromide and Iodide by IC method 300.0, dissolved ICP Metals, TOC by method 9060A, Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Anions: Chloride, Nitrate, Nitrite, and Sulfate by IC method 300.0. The soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Approved by



Date



Batch QC is included in the report. All LCS and LCSD (Sulfide) recoveries were within QC limits.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No other problems were encountered during the analysis of these samples.

Approved by Raven Beasley Date 2/14/12

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120126
Lab Code: R1200577-001

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	368		mg/L	2.0	1	NA	2/7/12 09:45	
Bromide	300.0	7.8		mg/L	1.0	10	NA	1/27/12 12:43	
Carbon, Total Organic (TOC), Average	9060A	113		mg/L	10	10	NA	1/31/12 17:41	
Chloride	300.0	431		mg/L	20	100	NA	1/27/12 14:40	
Iodide	300.0	7.9		mg/L	2.0	10	NA	2/9/12 14:59	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	1/27/12 12:43	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	1/27/12 11:56	
Sulfate	300.0	2.2		mg/L	2.0	10	NA	1/27/12 12:43	
Sulfide, Total	SM 4500-S2- F	15.0		mg/L	1.0	1	NA	1/31/12 13:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120126 Dissolved
Lab Code: R1200577-002

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/2/12 01:23	
Iron, Dissolved	6010C	100	U	µg/L	100	1	1/31/12	2/2/12 01:23	
Manganese, Dissolved	6010C	25		µg/L	10	1	1/31/12	2/2/12 01:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120126
Lab Code: R1200577-001

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	1/30/12 14:46		278113	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	1/30/12 14:46		278113	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		500	31	100	NA	2/1/12 17:45		278439	
1,1-Dichloroethane (1,1-DCA)	0.68	i	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,1-Dichloroethene (1,1-DCE)	48		5.0	0.29	1	NA	1/30/12 14:46		278113	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	1/30/12 14:46		278113	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	1/30/12 14:46		278113	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	1/30/12 14:46		278113	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
n-Butanol	250	U	250	11	1	NA	1/30/12 14:46		278113	
2-Butanone (MEK)	10	U	10	0.51	1	NA	1/30/12 14:46		278113	
2-Hexanone	10	U	10	0.35	1	NA	1/30/12 14:46		278113	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	1/30/12 14:46		278113	
Acetone	10	U	10	0.98	1	NA	1/30/12 14:46		278113	
Benzene	5.0	U	5.0	0.21	1	NA	1/30/12 14:46		278113	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Bromoform	5.0	U	5.0	0.27	1	NA	1/30/12 14:46		278113	
Bromomethane	5.0	U	5.0	0.31	1	NA	1/30/12 14:46		278113	
Carbon Disulfide	30		10	0.20	1	NA	1/30/12 14:46		278113	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	1/30/12 14:46		278113	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Chloroethane	5.0	U	5.0	0.31	1	NA	1/30/12 14:46		278113	
Chloroform	5.0	U	5.0	0.22	1	NA	1/30/12 14:46		278113	
Chloromethane	5.0	U	5.0	0.24	1	NA	1/30/12 14:46		278113	
Cyclohexane	10	U	10	0.24	1	NA	1/30/12 14:46		278113	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	1/30/12 14:46		278113	
Dichloromethane	5.0	U	5.0	0.22	1	NA	1/30/12 14:46		278113	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Methyl Acetate	10	U	10	0.23	1	NA	1/30/12 14:46		278113	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120126
Lab Code: R1200577-001

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Methylcyclohexane	10	U	10	0.25	1	NA	1/30/12 14:46		278113	
Styrene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Toluene	0.39	i	5.0	0.20	1	NA	1/30/12 14:46		278113	
Trichloroethene (TCE)	1700		500	23	100	NA	2/1/12 17:45		278439	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
Vinyl Chloride	10000		500	23	100	NA	2/1/12 17:45		278439	
cis-1,2-Dichloroethene	15000		500	20	100	NA	2/1/12 17:45		278439	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	1/30/12 14:46		278113	
o-Xylene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	
trans-1,2-Dichloroethene	250	i	500	20	100	NA	2/1/12 17:45		278439	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	1/30/12 14:46		278113	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	1/30/12 14:46	
Dibromofluoromethane	103	89-119	1/30/12 14:46	
Toluene-d8	102	87-121	1/30/12 14:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120126
Lab Code: R1200577-001

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	45		5.0	5	NA	1/30/12 13:41		278057	
Ethene	480		5.0	5	NA	1/30/12 13:41		278057	
Methane	1300		50	25	NA	1/30/12 14:07		278057	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: 1/26/12 1017
Date Received: 1/27/12
Date Analyzed: 1/30/12 19:18

Sample Name: LC34-RW0007-038.5-20120126
Lab Code: R1200577-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQ\DATA\HPLC05\DATA\013012\X0007394.D\

Analysis Lot: 278167
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	170	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	50	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	5.3	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120126
Lab Code: R1200577-003

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	288		mg/L	2.0	1	NA	2/7/12 09:45	
Bromide	300.0	4.8		mg/L	1.0	10	NA	1/27/12 12:59	
Carbon, Total Organic (TOC), Average	9060A	48.3		mg/L	4.0	4	NA	1/31/12 19:43	
Chloride	300.0	622		mg/L	20	100	NA	1/27/12 15:59	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/9/12 15:08	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	1/27/12 12:59	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	1/27/12 11:59	
Sulfate	300.0	3.5		mg/L	2.0	10	NA	1/27/12 12:59	
Sulfide, Total	SM 4500-S2- F	13.3		mg/L	1.0	1	NA	1/31/12 13:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120126 Dissolved
Lab Code: R1200577-004

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/2/12 01:28	
Iron, Dissolved	6010C	100	U	µg/L	100	1	1/31/12	2/2/12 01:28	
Manganese, Dissolved	6010C	15		µg/L	10	1	1/31/12	2/2/12 01:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120126
Lab Code: R1200577-003

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	50	U	50	2.4	10	NA	1/30/12 19:56		278113	
1,1,2,2-Tetrachloroethane	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,1,2-Trichloroethane	50	U	50	2.4	10	NA	1/30/12 19:56		278113	
1,1,2-Trichloro-1,2,2-trifluoroethane	1600		50	3.1	10	NA	1/30/12 19:56		278113	
1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,1-Dichloroethene (1,1-DCE)	9.4	i	50	2.9	10	NA	1/30/12 19:56		278113	
1,2,4-Trichlorobenzene	50	U	50	2.6	10	NA	1/30/12 19:56		278113	
1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	10	NA	1/30/12 19:56		278113	
1,2-Dibromoethane	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,2-Dichlorobenzene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,2-Dichloroethane	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,2-Dichloropropane	50	U	50	2.9	10	NA	1/30/12 19:56		278113	
1,3-Dichlorobenzene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
1,4-Dichlorobenzene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
n-Butanol	2500	U	2500	110	10	NA	1/30/12 19:56		278113	
2-Butanone (MEK)	100	U	100	5.1	10	NA	1/30/12 19:56		278113	
2-Hexanone	100	U	100	3.5	10	NA	1/30/12 19:56		278113	
4-Methyl-2-pentanone	100	U	100	2.7	10	NA	1/30/12 19:56		278113	
Acetone	100	U	100	9.8	10	NA	1/30/12 19:56		278113	
Benzene	50	U	50	2.1	10	NA	1/30/12 19:56		278113	
Bromodichloromethane	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Bromoform	50	U	50	2.7	10	NA	1/30/12 19:56		278113	
Bromomethane	50	U	50	3.1	10	NA	1/30/12 19:56		278113	
Carbon Disulfide	3.1	i	100	2.0	10	NA	1/30/12 19:56		278113	
Carbon Tetrachloride	50	U	50	2.7	10	NA	1/30/12 19:56		278113	
Chlorobenzene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Chloroethane	50	U	50	3.1	10	NA	1/30/12 19:56		278113	
Chloroform	50	U	50	2.2	10	NA	1/30/12 19:56		278113	
Chloromethane	50	U	50	2.4	10	NA	1/30/12 19:56		278113	
Cyclohexane	100	U	100	2.4	10	NA	1/30/12 19:56		278113	
Dibromochloromethane	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	10	NA	1/30/12 19:56		278113	
Dichloromethane	50	U	50	2.2	10	NA	1/30/12 19:56		278113	
Ethylbenzene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Isopropylbenzene (Cumene)	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Methyl Acetate	100	U	100	2.4	10	NA	1/30/12 19:56		278113	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120126
Lab Code: R1200577-003

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Methylcyclohexane	100	U	100	2.5	10	NA	1/30/12 19:56		278113	
Styrene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Tetrachloroethene (PCE)	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Toluene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Trichloroethene (TCE)	940		50	2.4	10	NA	1/30/12 19:56		278113	
Trichlorofluoromethane (CFC 11)	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
Vinyl Chloride	1000		50	2.4	10	NA	1/30/12 19:56		278113	
cis-1,2-Dichloroethene	1700		100	4.0	20	NA	2/1/12 18:20		278439	
cis-1,3-Dichloropropene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
m,p-Xylenes	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
n-Butyl Acetate	50	U	50	2.1	10	NA	1/30/12 19:56		278113	
o-Xylene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	
trans-1,2-Dichloroethene	22	i	50	2.0	10	NA	1/30/12 19:56		278113	
trans-1,3-Dichloropropene	50	U	50	2.0	10	NA	1/30/12 19:56		278113	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	1/30/12 19:56	
Dibromofluoromethane	102	89-119	1/30/12 19:56	
Toluene-d8	102	87-121	1/30/12 19:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12
Date Analyzed: 1/30/12 13:53

Sample Name: LC34-RW0008-052.0-20120126
Lab Code: R1200577-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star700.run

Analysis Lot: 278057
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	13		5.0	
74-85-1	Ethene	370		5.0	
74-82-8	Methane	490		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120126
Lab Code: R1200577-003

Service Request: R1200577
Date Collected: 1/26/12 1100
Date Received: 1/27/12
Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Pyruvic Acid	0.50	U	0.50	1	NA	2/16/12 00:33		280218	
Acetic Acid	100		1.0	1	NA	2/16/12 00:33		280218	
Butanoic Acid (Butyric Acid)	7.1		2.0	1	NA	2/16/12 00:33		280218	
Lactic Acid	1.0	U	1.0	1	NA	2/16/12 00:33		280218	
Propionic Acid	1.2		1.0	1	NA	2/16/12 00:33		280218	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: 1/26/12
Date Received: 1/27/12
Date Analyzed: 2/1/12 17:11

Sample Name: LC34-TB-20120126
Lab Code: R1200577-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020112\D7941.D\

Analysis Lot: 278439
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: 1/26/12
Date Received: 1/27/12
Date Analyzed: 2/1/12 17:11

Sample Name: LC34-TB-20120126
Lab Code: R1200577-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020112\D7941.D\

Analysis Lot: 278439
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/1/12 17:11	
Dibromofluoromethane	106	89-119	2/1/12 17:11	
Toluene-d8	105	87-121	2/1/12 17:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200577-MB

Service Request: R1200577
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	2/7/12 09:45	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	1/27/12 10:25	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	1/31/12 16:19	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	1/27/12 10:25	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	2/9/12 14:24	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	1/27/12 10:25	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	1/27/12 11:54	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	1/27/12 10:25	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	1/31/12 13:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200577-MB1

Service Request: R1200577
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/1/12 23:30	
Iron, Dissolved	6010C	100	U	µg/L	100	1	1/31/12	2/1/12 23:30	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/1/12 23:30	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200577-MB2

Service Request: R1200577
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/1/12 23:41	
Iron, Dissolved	6010C	100	U	µg/L	100	1	1/31/12	2/1/12 23:41	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	1/31/12	2/1/12 23:41	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1200577-MB3

Service Request: R1200577
Date Collected: NA
Date Received: NA
Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Iron, Dissolved	6010C	100 U	µg/L	100	1	1/31/12	2/2/12 17:47	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	1/31/12	2/2/12 17:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 1/26/12
 Sample Matrix: Water

Service Request: R1200577
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 1/30/12 11:39

Sample Name: Method Blank
 Lab Code: RQ1201010-08

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa12\Data\013012\U5934.D\

Analysis Lot: 278113
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: NA
Date Received: NA
Date Analyzed: 1/30/12 11:39

Sample Name: Method Blank
Lab Code: RQ1201010-08

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\013012\U5934.D\

Analysis Lot: 278113
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	1/30/12 11:39	
Dibromofluoromethane	98	89-119	1/30/12 11:39	
Toluene-d8	100	87-121	1/30/12 11:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: NA
Date Received: NA
Date Analyzed: 2/1/12 16:02

Sample Name: Method Blank
Lab Code: RQ1201096-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020112\D7939.D\

Analysis Lot: 278439
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: NA
Date Received: NA
Date Analyzed: 2/1/12 16:02

Sample Name: Method Blank
Lab Code: RQ1201096-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\020112\07939.D\

Analysis Lot: 278439
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	2/1/12 16:02	
Dibromofluoromethane	107	89-119	2/1/12 16:02	
Toluene-d8	107	87-121	2/1/12 16:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: NA
Date Received: NA
Date Analyzed: 1/30/12 09:30

Sample Name: Method Blank
Lab Code: RQ1200918-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star681.run

Analysis Lot: 278057
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Collected: NA
Date Received: NA
Date Analyzed: 1/30/12 11:56

Sample Name: Method Blank
Lab Code: RQ1200962-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\013012\X0007380.D\

Analysis Lot: 278167
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1201678-01

Service Request: R1200577
Date Collected: NA
Date Received: NA
Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Pyruvic Acid	0.50	U	0.50	1	NA	2/15/12 21:24		280218	
Acetic Acid	1.0	U	1.0	1	NA	2/15/12 21:24		280218	
Butanoic Acid (Butyric Acid)	2.0	U	2.0	1	NA	2/15/12 21:24		280218	
Lactic Acid	1.0	U	1.0	1	NA	2/15/12 21:24		280218	
Propionic Acid	1.0	U	1.0	1	NA	2/15/12 21:24		280218	

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/31/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1200577-LCS1			Duplicate Lab Control Sample R1200577-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	5.53	5.2	105	5.59	5.2	107	56 - 138	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/27/12 -
 2/ 9/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1200577-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.962	1.00	96	90 - 110
Chloride	300.0	1.96	2.00	98	90 - 110
Iodide	300.0	0.942	1.00	94	90 - 110
Nitrate as Nitrogen	300.0	0.963	1.00	96	90 - 110
Nitrite as Nitrogen	353.2	0.246	0.250	99	90 - 110
Sulfate	300.0	1.92	2.00	96	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	20.2	20.0	101	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.92	10.0	99	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 2/ 1/12

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1200577-LCS

Analyte Name	Method	Result	Spike		% Rec	% Rec Limits
			Amount	% Rec		
Arsenic, Dissolved	6010C	37.3	40	93	80 - 120	
Iron, Dissolved	6010C	1000	1000	100	80 - 120	
Manganese, Dissolved	6010C	489	500	98	80 - 120	

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/30/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 278113

**Lab Control Sample
 RQ1201010-07**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.7	20.0	89	72 - 128
1,1,2,2-Tetrachloroethane	23.6	20.0	118	72 - 131
1,1,2-Trichloroethane	20.0	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.9	20.0	85	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.2	20.0	86	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.1	20.0	90	72 - 129
1,2,4-Trichlorobenzene	24.6	20.0	123	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	26.0	20.0	130	62 - 131
1,2-Dibromoethane	20.4	20.0	102	78 - 125
1,2-Dichlorobenzene	22.2	20.0	111	79 - 124
1,2-Dichloroethane	19.0	20.0	95	73 - 127
1,2-Dichloropropane	17.9	20.0	90	80 - 123
1,3-Dichlorobenzene	22.1	20.0	111	78 - 124
1,4-Dichlorobenzene	21.4	20.0	107	78 - 123
n-Butanol	1140	1000	114	70 - 130
2-Butanone (MEK)	18.8	20.0	94	60 - 133
2-Hexanone	20.7	20.0	103	61 - 131
4-Methyl-2-pentanone	20.1	20.0	100	61 - 132
Acetone	19.0	20.0	95	54 - 139
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	19.5	20.0	98	80 - 125
Bromoform	23.3	20.0	117	68 - 130
Bromomethane	18.9	20.0	95	57 - 144
Carbon Disulfide	24.7	20.0	123	52 - 140
Carbon Tetrachloride	18.4	20.0	92	68 - 133
Chlorobenzene	20.6	20.0	103	80 - 121
Chloroethane	17.5	20.0	88	71 - 130
Chloroform	18.7	20.0	94	78 - 125
Chloromethane	18.6	20.0	93	61 - 138
Cyclohexane	18.5	20.0	93	57 - 126
Dibromochloromethane	21.6	20.0	108	78 - 133
Dichlorodifluoromethane (CFC 12)	20.8	20.0	104	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/30/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 278113

Lab Control Sample

RQ1201010-07

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.0	20.0	90	75 - 125
Ethylbenzene	20.8	20.0	104	78 - 123
Isopropylbenzene (Cumene)	24.3	20.0	122	73 - 133
Methyl Acetate	21.4	20.0	107	57 - 157
Methyl tert-Butyl Ether	19.0	20.0	95	75 - 126
Methylcyclohexane	20.1	20.0	100	61 - 125
Styrene	20.8	20.0	104	80 - 132
Tetrachloroethene (PCE)	20.4	20.0	102	72 - 131
Toluene	20.1	20.0	100	78 - 122
Trichloroethene (TCE)	19.4	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	18.6	20.0	93	69 - 141
Vinyl Chloride	19.1	20.0	95	72 - 138
cis-1,2-Dichloroethene	19.4	20.0	97	78 - 122
cis-1,3-Dichloropropene	18.2	20.0	91	77 - 125
m,p-Xylenes	41.7	40.0	104	79 - 126
n-Butyl Acetate	19.2	20.0	96	31 - 144
o-Xylene	20.7	20.0	104	77 - 118
trans-1,2-Dichloroethene	18.9	20.0	95	75 - 121
trans-1,3-Dichloropropene	20.1	20.0	100	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 2/1/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 278439

Lab Control Sample

RQ1201096-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.9	20.0	90	72 - 128
1,1,2,2-Tetrachloroethane	19.5	20.0	98	72 - 131
1,1,2-Trichloroethane	19.8	20.0	99	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.2	20.0	81	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.1	20.0	96	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.6	20.0	88	72 - 129
1,2,4-Trichlorobenzene	21.6	20.0	108	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.5	20.0	93	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	20.1	20.0	100	79 - 124
1,2-Dichloroethane	22.0	20.0	110	73 - 127
1,2-Dichloropropane	20.1	20.0	101	80 - 123
1,3-Dichlorobenzene	19.2	20.0	96	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	930	1000	93	70 - 130
2-Butanone (MEK)	19.7	20.0	98	60 - 133
2-Hexanone	19.8	20.0	99	61 - 131
4-Methyl-2-pentanone	20.5	20.0	103	61 - 132
Acetone	20.7	20.0	104	54 - 139
Benzene	20.3	20.0	102	78 - 121
Bromodichloromethane	20.2	20.0	101	80 - 125
Bromoform	23.0	20.0	115	68 - 130
Bromomethane	21.7	20.0	109	57 - 144
Carbon Disulfide	23.4	20.0	117	52 - 140
Carbon Tetrachloride	20.2	20.0	101	68 - 133
Chlorobenzene	20.1	20.0	101	80 - 121
Chloroethane	18.9	20.0	94	71 - 130
Chloroform	19.5	20.0	97	78 - 125
Chloromethane	22.5	20.0	113	61 - 138
Cyclohexane	23.5	20.0	117	57 - 126
Dibromochloromethane	20.6	20.0	103	78 - 133
Dichlorodifluoromethane (CFC 12)	19.5	20.0	98	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 2/ 1/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 278439

Lab Control Sample
RQ1201096-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.0	20.0	95	75 - 125
Ethylbenzene	19.4	20.0	97	78 - 123
Isopropylbenzene (Cumene)	21.5	20.0	107	73 - 133
Methyl Acetate	21.6	20.0	108	57 - 157
Methyl tert-Butyl Ether	18.2	20.0	91	75 - 126
Methylcyclohexane	18.7	20.0	94	61 - 125
Styrene	17.9	20.0	89	80 - 132
Tetrachloroethene (PCE)	22.1	20.0	111	72 - 131
Toluene	20.3	20.0	102	78 - 122
Trichloroethene (TCE)	20.4	20.0	102	74 - 127
Trichlorofluoromethane (CFC 11)	19.2	20.0	96	69 - 141
Vinyl Chloride	20.5	20.0	102	72 - 138
cis-1,2-Dichloroethene	18.7	20.0	94	78 - 122
cis-1,3-Dichloropropene	19.0	20.0	95	77 - 125
m,p-Xylenes	39.4	40.0	99	79 - 126
n-Butyl Acetate	19.0	20.0	95	31 - 144
o-Xylene	18.9	20.0	94	77 - 118
trans-1,2-Dichloroethene	18.9	20.0	94	75 - 121
trans-1,3-Dichloropropene	18.7	20.0	93	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/30/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 278057

Lab Control Sample
RQ1200918-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	23.7	26.0	91	56 - 148
Ethene	20.7	24.3	85	58 - 155
Methane	23.7	26.2	90	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577
Date Analyzed: 1/30/12

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 278167

Analyte Name	Lab Control Sample RQ1200962-02			Duplicate Lab Control Sample RQ1200962-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	0.840	0.991	85	0.850	0.991	86	70 - 130	1	30
Acetic Acid	8.70	10.3	85	8.92	10.3	87	70 - 135	2	30
Butanoic Acid (Butyric Acid)	9.24	10.1	91	9.24	10.1	91	78 - 113	<1	30
Lactic Acid	9.60	10.0	96	9.60	10.0	96	61 - 109	<1	30
Propionic Acid	9.55	9.93	96	8.92	9.93	90	80 - 125	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 1/26/12
Sample Matrix: Water

Service Request: R1200577

Date Analyzed: 2/15/12

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L

Basis: NA

Analysis Lot: 280218

Analyte Name	Lab Control Sample RQ1201678-02			Duplicate Lab Control Sample RQ1201678-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.06	1.00	106	1.04	1.00	104	70 - 130	2	30
Acetic Acid	9.72	10.3	95	9.54	10.3	93	70 - 135	2	30
Butanoic Acid (Butyric Acid)	7.86	10.1	78	9.93	10.1	98	78 - 113	23	30
Lactic Acid	9.08	10.0	90	8.98	10.0	89	61 - 109	1	30
Propionic Acid	10.0	10.1	100	10.1	10.1	100	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH.585-288-5380 FAX.585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MES (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-20120120	1/26/12	10:17	-001, 002	W	15	3	2	1	3	1	3	1	1	
LC34-RW0008-052.0-20120126	1/26/12	11:00	003, 004	W	15	3	2	1	3	1	3	1	1	
LC34-TB-20120126	NA	NA	-005	W	3	3								

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barillet
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 1/26/12 - 1630

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Fred Cox
 Firm: _____
 Date/Time: 1/26/12 - 1630

Comments/Special Instructions:
 Please filter dissolved metals in lab

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Amy Hentschke
 Firm: ALS
 Date/Time: 1/27/12 1005

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Amy Hentschke
 Firm: ALS
 Date/Time: 1/27/12 1005

R1200577
 GeoSyntec Consultants
 ESTCP PED LC34 126812



Cooler Receipt And Preservation Check Form

Project/Client GeoSyntec Folder Number R1200577

Cooler received on 1/27/12 by: AHL COURIER: CAS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO*
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 3.5°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 1/27/12 1010

Thermometer ID IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition, Client Approval to Run Samples: _____

PC Secondary Review: KB 1/27/12

Cooler Breakdown: Date: 1/27/12 Time: 1026 by: AHL

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH	X		WC1031386	10/12				
≤2	HNO ₃								
≤2	H ₂ SO ₄			WC1031385	11/12				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	WC103210F	10/12				
	HCl	*	*						

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: W1211-2xx, 062711-22, 1-144-001

Other Comments:

* 1 vial for L34-RW0008 for organic acid broken.

PC Secondary Review: KB 2/14/12

*significant air bubbles: VOA > 5-6 mm ; WC > 1 in. diameter

Certificate of Analysis: Gene-Trac® *Dehalococcoides* Assay

Customer: Cory Repta, Geosyntec Consultants

SiREM Reference: S-2471

Project: ESTCP LC34 PED

Report Date: 6-Mar-12

Customer Reference: TR0272A

Data Files: MyiQ-DHC-QPCR-0876
MyiQ-DB-DHC-QPCR-0272

Table 1a: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc *	<i>Dehalococcoides</i> Enumeration/Liter **
LC34-RW0007-038.5-20120214	DHC-8066	14-Feb-12	Groundwater	15 - 38 %	2 x 10 ⁸
LC34-RW0008-052.0-20120214	DHC-8067	14-Feb-12	Groundwater	10 - 27 %	1 x 10 ⁸
LC34-BW0003C-038.5-20120215	DHC-8068	15-Feb-12	Groundwater	23 - 54 %	3 x 10 ⁸
LC34-BW0003E-052.5-20120215	DHC-8069	15-Feb-12	Groundwater	0.3 - 0.8 %	1 x 10 ⁶
LC34-BW0001C-038.5-20120216	DHC-8070	16-Feb-12	Groundwater	4 - 12 %	5 x 10 ⁷
LC34-BW0001E-052.5-20120216	DHC-8071	16-Feb-12	Groundwater	4 - 12 %	3 x 10 ⁷

Notes:

* Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample. Range represents normal variation in Dhc enumeration.

** Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.


J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *Dehalococcoides* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Approved: 
Ximena Druar, B.Sc.
Molecular Biology Coordinator

Certificate of Analysis: Gene-Trac® VC, Vinyl Chloride Reductase (*vcrA*) Assay

Customer: Cory Repta, Geosyntec Consultants

SiREM Reference: S-2471

Project: ESTCP LC34 PED

Report Date: 6-Mar-12

Customer Reference: TR0272A

Data Files: MyiQ-VC-QPCR-0458
VC-QPCR-Check-gel-0479
MyiQ-DB-VC-QPCR-0202

Table 1b: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent <i>vcrA</i> *	Vinyl Chloride Reductase (<i>vcrA</i>) Gene Copies/Liter
LC34-RW0007-038.5-20120214	VCR-3125	14-Feb-12	Groundwater	2 - 6 %	3 x 10 ⁷
LC34-RW0008-052.0-20120214	VCR-3126	14-Feb-12	Groundwater	3 - 9 %	3 x 10 ⁷

Notes:

* Percent *vcrA* in microbial population. This value is calculated by dividing the number of vinyl chloride reductase A (*vcrA*) gene copies quantified by the total number of bacteria estimated to be in the sample based on the mass of DNA extracted from the sample. Range represents normal variation in enumeration of *vcrA*.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *vcrA* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

C Correction factor applied to correct for non-specific PCR amplification products.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician


Approved: 
Ximena Druar, B.Sc.
Molecular Biology Coordinator

Table 2.1: Detailed Test Parameters, Test Reference S-2471

Customer Sample ID	LC34-RW0007-038.5-20120214	LC34-RW0008-052.0-20120214	LC34-BW0003C-038.5-20120215
SiREM Sample ID	DHC-8066/VCR-3125	DHC-8067/VCR-3126	DHC-8068
Date Received	21-Feb-12	21-Feb-12	21-Feb-12
Sample Temperature	9 °C	9 °C	9 °C
Filtration Date	23-Feb-12	23-Feb-12	23-Feb-12
Volume Used for DNA Extraction	500 mL	500 mL	500 mL
DNA Extraction Date	27-Feb-12	27-Feb-12	27-Feb-12
DNA Concentration in Sample (extractable)	2505 ng/L	2015 ng/L	2556 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
Dhc qPCR Date Analyzed	2-Mar-12	2-Mar-12	2-Mar-12
vcrA qPCR Date Analyzed	5-Mar-12	5-Mar-12	NA
qPCR Controls (see Tables 3 & 4)	Passed	Passed	Passed
Comments	--	--	vcrA analysis not performed upon client request.

Notes:

Refer to Tables 3 & 4 for detailed results of controls.

°C = degrees Celsius

ng/L = nanograms per liter

mL = milliliters

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = *Dehalococcoides*

vcrA = vinyl chloride reductase

DNA = Deoxyribonucleic acid

NA = not applicable

Table 2.2: Detailed Test Parameters, Test Reference S-2471

Customer Sample ID	LC34-BW0003E-052.5-20120215	LC34-BW0001C-038.5-20120216	LC34-BW0001E-052.5-20120216
SiREM Sample ID	DHC-8069	DHC-8070	DHC-8071
Date Received	21-Feb-12	21-Feb-12	21-Feb-12
Sample Temperature	9 °C	9 °C	9 °C
Filtration Date	23-Feb-12	23-Feb-12	23-Feb-12
Volume Used for DNA Extraction	500 mL	500 mL	500 mL
DNA Extraction Date	27-Feb-12	27-Feb-12	27-Feb-12
DNA Concentration in Sample (extractable)	923 ng/L	2301 ng/L	1313 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
Dhc qPCR Date Analyzed	2-Mar-12	2-Mar-12	2-Mar-12
vcrA qPCR Date Analyzed	NA	NA	NA
qPCR Controls (see Tables 3 & 4)	Passed	Passed	Passed
Comments	<i>vcrA</i> analysis not performed upon client request.	<i>vcrA</i> analysis not performed upon client request.	<i>vcrA</i> analysis not performed upon client request.

Notes:

Refer to Tables 3 & 4 for detailed results of controls.

°C = degrees Celsius

ng/L = nanograms per liter

mL = milliliters

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = *Dehalococcoides*

vcrA = vinyl chloride reductase

DNA = Deoxyribonucleic acid

NA = not applicable

Table 3: Gene-Trac Dhc Control Results, Test Reference S-2471

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Liter	Recovered Dhc 16S rRNA Gene Copies per Liter	Comments
Positive Control Low Concentration	2-Mar-12	qPCR with KB1 genomic DNA (CSLD-0513)	1.4×10^5	1.4×10^5	--
Positive Control High Concentration	2-Mar-12	qPCR with KB1 genomic DNA (CSHD-0513)	1.8×10^7	1.9×10^7	--
Negative Control	2-Mar-12	Tris Reagent Blank (TBD-0473)	0	2.6×10^3 U	--
DNA Extraction Blank	1-Mar-12	DNA extraction sterile water (FB-1639)	0	2.6×10^3 U	--

Notes:

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.

Table 4: Gene-Trac VC Control Results, Test Reference S-2471

Laboratory Control	Analysis Date	Control Description	Spiked <i>vcrA</i> reductase Gene Copies per Liter	Recovered <i>vcrA</i> reductase Gene Copies per Liter	Comments
Positive Control Low Concentration	5-Mar-12	qPCR with KB-1 genomic DNA (CSLV-0326)	2.1×10^5	2.9×10^5	--
Positive Control High Concentration	5-Mar-12	qPCR with KB-1 genomic DNA (CSHV-0326)	2.7×10^7	3.3×10^7	--
Negative Control	5-Mar-12	Tris Reagent Blank (TBV-0297)	0	2.6×10^3 U	--
DNA Extraction Blank	5-Mar-12	DNA extraction sterile water (FB-1639)	0	2.6×10^3 U	--

Notes:

qPCR = quantitative PCR

DNA = Deoxyribonucleic acid

16S rRNA = 16S ribosomal ribonucleic acid

vcrA = vinyl chloride reductase

U Not detected, associated value is the quantification limit.



March 01, 2012

Service Request No: R1201033

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: LC34 Soils 2/13/12/ TR0272

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on February 15, 2012. For your reference, these analyses have been assigned our service request number **R1201033**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

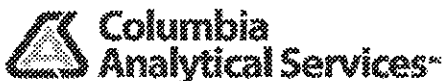
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 118



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 2/13/12
Sample Matrix: Soil

Service Request No.: R1201033
Date Received: 2/15/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-two (22) soil samples and one (1) Trip Blank were collected by the client on 2/13/12 in Terracore samplers and were received for analysis at Columbia Analytical Services on 2/15/12 via a national courier. The samples were received at a cooler temperature range of 2.1-5.7°C within the guidelines of 0-6°C. The sample ID's were revised as per a client email on 2/15/12.

Organic Compounds

Twenty-two (22) water samples and one (1) Trip Blank were analyzed for a client specific list of Volatile Organics by Method 8260C. All soils were analyzed for % Solids in order to report all data on a dry weight basis.

Initial Calibration Criteria was met for all samples for 8260C. The Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for the following:

n-Butyl Acetate on the 2/23/12 run,
Acetone, Bromomethane, and Chloroform on the 2/24/12 (analysis lot #281378) analytical run,
Bromoform, Bromomethane, and n-Butyl Acetate on the 2/24/12 (analysis lot# 281373) run,
Acetone and Bromomethane on the 2/25/12 (analysis lot # 281419) run,
Bromomethane on the 2/25/12 (analysis lot #281447) run,
1,1-Dichloroethene, MEK, Carbon Disulfide, Chloroform, Dichloromethane on the 2/27/12.

All detected concentrations for these compound in samples associated with these CCV's should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicates (LCSD for Organic Acids only) recoveries were all within QC limits except for the following:

Tetrachloroethene on the LCS from 2/24/12,
and 1,2-Dichloropropane on the LCS from 2/25/12.

The Relative Percent Difference (RPD) calculations were acceptable except for the following:

n-Butanol, 2-Hexanone, 4-Methyl-2-pentanone, Bromoform and Chloroethane on the 2/25/12 LCS/LCSD.
All exceedences have been flagged as "*".

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

Sample location LC34-DPT045.5-20120213 (R1201033-019) was repeated twice at the low level and once at as a medium level. The results varied between runs. Rather than merge the sample data, all runs have been reported by adding on the low level results as 2 additional locations to report: LC34-DPT045.4-20120213 (R1201033-024) and LC34-DPT045.6-20120213 (R1201033-025). The depths were altered slightly as per client instructions.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Approved by Karon Beuker Date 3/30/12

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "T", estimated.

The Laboratory Method Blanks were free from contamination except for low level hits for MEK on the 2/23/12, 2/24/12 (analysis lot # 281378), and 2/25/12 blanks, Acetone on the 2/24/12 (analysis lot #281378) and Bromomethane on the 2/27/12 blank. Any affected sample hits would be flagged as "B".

No other analytical or QC problems were encountered.

Approved by Laura Berber Date 3/30/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1201033

<u>Lab ID</u>	<u>Client ID</u>
R1201033-001	LC34-DPT0346-037.0-20120213
R1201033-002	LC34-DPT0346-040.0-20120213
R1201033-003	LC34-DPT0346-043.5-20120213
R1201033-004	LC34-DPT0346-046.5-20120213
R1201033-005	LC34-DPT0346-045.0-20120213
R1201033-006	LC34-DPT0346-048.0-20120213
R1201033-007	LC34-DPT0346-053.0-20120213
R1201033-008	LC34-DPT0346-055.0-20120213
R1201033-009	LC34-DPT0347-037.0-20120213
R1201033-010	LC34-DPT0347-040.0-20120213
R1201033-011	LC34-DPT0347-045.5-20120213
R1201033-012	LC34-DPT0347-047.0-20120213
R1201033-013	LC34-DPT0347-050.0-20120213
R1201033-014	LC34-DPT0347-050.5-20120213
R1201033-015	LC34-DPT0347-053.0-20120213
R1201033-016	LC34-DPT0348-034.5-20120213
R1201033-017	LC34-DPT0348-037.0-20120213
R1201033-018	LC34-DPT0348-040.0-20120213
R1201033-019	LC34-DPT0348-045.5-20120213
R1201033-020	LC34-DPT0348-047.0-20120213
R1201033-021	LC34-DPT0348-048.5-20120213
R1201033-022	LC34-DPT0348-053.0-20120213
R1201033-023	LC34-TB-20120213
R1201033-024	LC34-DPT0348-045.4-20120213
R1201033-025	LC34-DPT0348-045.6-20120213

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-037.0-20120213
Lab Code: R1201033-001

Service Request: R1201033
Date Collected: 2/13/12 0848
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.2	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0848
Date Received: 2/15/12
Date Analyzed: 2/23/12 19:55

Sample Name: LC34-DPT0346-037.0-20120213
Lab Code: R1201033-001

Units: µg/Kg
Basis: Dry
Percent Solids: 70.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8496.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 110.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	790	U	790	57	
79-34-5	1,1,2,2-Tetrachloroethane	790	U	790	32	
79-00-5	1,1,2-Trichloroethane	790	U	790	37	
75-34-3	1,1-Dichloroethane (1,1-DCA)	790	U	790	32	
75-35-4	1,1-Dichloroethene (1,1-DCE)	790	U	790	32	
107-06-2	1,2-Dichloroethane	790	U	790	32	
78-87-5	1,2-Dichloropropane	790	U	790	40	
71-36-3	n-Butanol	39000	U	39000	2500	
78-93-3	2-Butanone (MEK)	790	U	790	110	
591-78-6	2-Hexanone	790	U	790	40	
108-10-1	4-Methyl-2-pentanone	790	U	790	37	
67-64-1	Acetone	790	U	790	180	
71-43-2	Benzene	790	U	790	32	
75-27-4	Bromodichloromethane	790	U	790	32	
75-25-2	Bromoform	790	U	790	38	
74-83-9	Bromomethane	790	U	790	65	
75-15-0	Carbon Disulfide	790	U	790	150	
56-23-5	Carbon Tetrachloride	790	U	790	41	
108-90-7	Chlorobenzene	120	I	790	32	
75-00-3	Chloroethane	790	U	790	60	
67-66-3	Chloroform	790	U	790	32	
74-87-3	Chloromethane	790	U	790	73	
124-48-1	Dibromochloromethane	790	U	790	32	
75-09-2	Dichloromethane	790	U	790	43	
100-41-4	Ethylbenzene	790	U	790	32	
100-42-5	Styrene	790	U	790	32	
127-18-4	Tetrachloroethene (PCE)	790	U	790	32	
108-88-3	Toluene	790	U	790	32	
79-01-6	Trichloroethene (TCE)	620	I	790	32	
75-01-4	Vinyl Chloride	1700		790	45	
156-59-2	cis-1,2-Dichloroethene	6100		790	130	
10061-01-5	cis-1,3-Dichloropropene	790	U	790	32	
179601-23-1	m,p-Xylenes	1600	U	1600	110	
123-86-4	n-Butyl Acetate	790	U	790	32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0848
Date Received: 2/15/12
Date Analyzed: 2/23/12 19:55

Sample Name: LC34-DPT0346-037.0-20120213
Lab Code: R1201033-001

Units: µg/Kg
Basis: Dry
Percent Solids: 70.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\022312\D8496.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 110.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	790 U	790	32	
156-60-5	trans-1,2-Dichloroethene	99 I	790	37	
10061-02-6	trans-1,3-Dichloropropene	790 U	790	32	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/23/12 19:55	
Dibromofluoromethane	104	89-119	2/23/12 19:55	
Toluene-d8	105	87-121	2/23/12 19:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-040.0-20120213
Lab Code: R1201033-002

Service Request: R1201033
Date Collected: 2/13/12 0858
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	67.4	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0858
Date Received: 2/15/12
Date Analyzed: 2/23/12 20:25

Sample Name: LC34-DPT0346-040.0-20120213
Lab Code: R1201033-002

Units: µg/Kg
Basis: Dry
Percent Solids: 67.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8497.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 237

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1800	U	1800	130	
79-34-5	1,1,2,2-Tetrachloroethane	1800	U	1800	71	
79-00-5	1,1,2-Trichloroethane	1800	U	1800	81	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1800	U	1800	71	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1800	U	1800	71	
107-06-2	1,2-Dichloroethane	1800	U	1800	71	
78-87-5	1,2-Dichloropropane	1800	U	1800	88	
71-36-3	n-Butanol	88000	U	88000	5500	
78-93-3	2-Butanone (MEK)	1800	U	1800	240	
591-78-6	2-Hexanone	1800	U	1800	88	
108-10-1	4-Methyl-2-pentanone	1800	U	1800	81	
67-64-1	Acetone	1800	U	1800	400	
71-43-2	Benzene	1800	U	1800	71	
75-27-4	Bromodichloromethane	1800	U	1800	71	
75-25-2	Bromoform	1800	U	1800	85	
74-83-9	Bromomethane	1800	U	1800	150	
75-15-0	Carbon Disulfide	1800	U	1800	320	
56-23-5	Carbon Tetrachloride	1800	U	1800	92	
108-90-7	Chlorobenzene	140	I	1800	71	
75-00-3	Chloroethane	1800	U	1800	140	
67-66-3	Chloroform	1800	U	1800	71	
74-87-3	Chloromethane	1800	U	1800	170	
124-48-1	Dibromochloromethane	1800	U	1800	71	
75-09-2	Dichloromethane	1800	U	1800	95	
100-41-4	Ethylbenzene	1800	U	1800	71	
100-42-5	Styrene	1800	U	1800	71	
127-18-4	Tetrachloroethene (PCE)	1800	U	1800	71	
108-88-3	Toluene	1800	U	1800	71	
79-01-6	Trichloroethene (TCE)	420	I	1800	71	
75-01-4	Vinyl Chloride	670	I	1800	99	
156-59-2	cis-1,2-Dichloroethene	14000		1800	280	
10061-01-5	cis-1,3-Dichloropropene	1800	U	1800	71	
179601-23-1	m,p-Xylenes	3500	U	3500	240	
123-86-4	n-Butyl Acetate	1800	U	1800	71	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0858
Date Received: 2/15/12
Date Analyzed: 2/23/12 20:25

Sample Name: LC34-DPT0346-040.0-20120213
Lab Code: R1201033-002

Units: µg/Kg
Basis: Dry
Percent Solids: 67.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8497.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 237

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	1800	U	1800	71	
156-60-5	trans-1,2-Dichloroethene	340	I	1800	81	
10061-02-6	trans-1,3-Dichloropropene	1800	U	1800	71	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/23/12 20:25	
Dibromofluoromethane	105	89-119	2/23/12 20:25	
Toluene-d8	106	87-121	2/23/12 20:25	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-043.5-20120213
Lab Code: R1201033-003

Service Request: R1201033
Date Collected: 2/13/12 0909
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	81.1		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0909
Date Received: 2/15/12
Date Analyzed: 2/23/12 20:55

Sample Name: LC34-DPT0346-043.5-20120213
Lab Code: R1201033-003

Units: µg/Kg
Basis: Dry
Percent Solids: 81.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\022312\D8498.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 154

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	950 U	950	69	
79-34-5	1,1,2,2-Tetrachloroethane	950 U	950	38	
79-00-5	1,1,2-Trichloroethane	950 U	950	44	
75-34-3	1,1-Dichloroethane (1,1-DCA)	950 U	950	38	
75-35-4	1,1-Dichloroethene (1,1-DCE)	950 U	950	38	
107-06-2	1,2-Dichloroethane	950 U	950	38	
78-87-5	1,2-Dichloropropane	950 U	950	48	
71-36-3	n-Butanol	47000 U	47000	3000	
78-93-3	2-Butanone (MEK)	950 U	950	130	
591-78-6	2-Hexanone	950 U	950	48	
108-10-1	4-Methyl-2-pentanone	950 U	950	44	
67-64-1	Acetone	950 U	950	220	
71-43-2	Benzene	950 U	950	38	
75-27-4	Bromodichloromethane	950 U	950	38	
75-25-2	Bromoform	950 U	950	46	
74-83-9	Bromomethane	950 U	950	78	
75-15-0	Carbon Disulfide	950 U	950	180	
56-23-5	Carbon Tetrachloride	950 U	950	50	
108-90-7	Chlorobenzene	110 I	950	38	
75-00-3	Chloroethane	950 U	950	73	
67-66-3	Chloroform	950 U	950	38	
74-87-3	Chloromethane	950 U	950	88	
124-48-1	Dibromochloromethane	950 U	950	38	
75-09-2	Dichloromethane	950 U	950	52	
100-41-4	Ethylbenzene	950 U	950	38	
100-42-5	Styrene	950 U	950	38	
127-18-4	Tetrachloroethene (PCE)	950 U	950	38	
108-88-3	Toluene	950 U	950	38	
79-01-6	Trichloroethene (TCE)	4900	950	38	
75-01-4	Vinyl Chloride	1600	950	54	
156-59-2	cis-1,2-Dichloroethene	6300	950	150	
10061-01-5	cis-1,3-Dichloropropene	950 U	950	38	
179601-23-1	m,p-Xylenes	1900 U	1900	130	
123-86-4	n-Butyl Acetate	950 U	950	38	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0909
Date Received: 2/15/12
Date Analyzed: 2/23/12 20:55

Sample Name: LC34-DPT0346-043.5-20120213
Lab Code: R1201033-003

Units: µg/Kg
Basis: Dry
Percent Solids: 81.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8498.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 154

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	950 U	950	38	
156-60-5	trans-1,2-Dichloroethene	53 I	950	44	
10061-02-6	trans-1,3-Dichloropropene	950 U	950	38	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/23/12 20:55	
Dibromofluoromethane	104	89-119	2/23/12 20:55	
Toluene-d8	106	87-121	2/23/12 20:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-046.5-20120213
Lab Code: R1201033-004

Service Request: R1201033
Date Collected: 2/13/12 0930
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	74.3	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0930
Date Received: 2/15/12
Date Analyzed: 2/27/12 22:05

Sample Name: LC34-DPT0346-046.5-20120213
Lab Code: R1201033-004

Units: µg/Kg
Basis: Dry
Percent Solids: 74.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6492.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: .73

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	4.9 U	4.9	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	4.9 U	4.9	0.35	
79-00-5	1,1,2-Trichloroethane	4.9 U	4.9	0.28	
75-34-3	1,1-Dichloroethane (1,1-DCA)	4.9 U	4.9	0.27	
75-35-4	1,1-Dichloroethene (1,1-DCE)	4.9 U	4.9	0.37	
107-06-2	1,2-Dichloroethane	4.9 U	4.9	0.30	
78-87-5	1,2-Dichloropropane	4.9 U	4.9	0.36	
71-36-3	n-Butanol	250 U	250	12	
78-93-3	2-Butanone (MEK)	3.2 I	4.9	2.0	
591-78-6	2-Hexanone	4.9 U	4.9	1.2	
108-10-1	4-Methyl-2-pentanone	4.9 U	4.9	0.42	
67-64-1	Acetone	18	4.9	1.1	
71-43-2	Benzene	4.9 U	4.9	0.24	
75-27-4	Bromodichloromethane	4.9 U	4.9	0.28	
75-25-2	Bromoform	4.9 U	4.9	0.41	
74-83-9	Bromomethane	4.9 U	4.9	0.38	
75-15-0	Carbon Disulfide	15	4.9	0.28	
56-23-5	Carbon Tetrachloride	4.9 U	4.9	0.75	
108-90-7	Chlorobenzene	0.41 I	4.9	0.32	
75-00-3	Chloroethane	4.9 U	4.9	0.43	
67-66-3	Chloroform	4.9 U	4.9	0.53	
74-87-3	Chloromethane	4.9 U	4.9	0.44	
124-48-1	Dibromochloromethane	4.9 U	4.9	0.35	
75-09-2	Dichloromethane	4.9 U	4.9	0.22	
100-41-4	Ethylbenzene	4.9 U	4.9	0.42	
100-42-5	Styrene	4.9 U	4.9	0.31	
127-18-4	Tetrachloroethene (PCE)	4.9 U	4.9	0.57	
108-88-3	Toluene	0.39 I	4.9	0.31	
79-01-6	Trichloroethene (TCE)	2.4 I	4.9	0.51	
75-01-4	Vinyl Chloride	6.5	4.9	0.47	
156-59-2	cis-1,2-Dichloroethene	7.5	4.9	0.37	
10061-01-5	cis-1,3-Dichloropropene	4.9 U	4.9	0.35	
179601-23-1	m,p-Xylenes	9.8 U	9.8	0.68	
123-86-4	n-Butyl Acetate	0.87 I	4.9	0.45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0930
Date Received: 2/15/12
Date Analyzed: 2/27/12 22:05

Sample Name: LC34-DPT0346-046.5-20120213
Lab Code: R1201033-004

Units: µg/Kg
Basis: Dry
Percent Solids: 74.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6492.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: .73

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	4.9 U	4.9	0.31	
156-60-5	trans-1,2-Dichloroethene	0.89 I	4.9	0.38	
10061-02-6	trans-1,3-Dichloropropene	4.9 U	4.9	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	77-128	2/27/12 22:05	
Dibromofluoromethane	97	65-136	2/27/12 22:05	
Toluene-d8	100	75-126	2/27/12 22:05	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-045.0-20120213
Lab Code: R1201033-005

Service Request: R1201033
Date Collected: 2/13/12 0919
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	79.6	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0919
Date Received: 2/15/12
Date Analyzed: 2/24/12 16:03

Sample Name: LC34-DPT0346-045.0-20120213
Lab Code: R1201033-005

Units: µg/Kg
Basis: Dry
Percent Solids: 79.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8521.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 244

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1500	U	1500	120	
79-34-5	1,1,2,2-Tetrachloroethane	1500	U	1500	62	
79-00-5	1,1,2-Trichloroethane	1500	U	1500	71	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1500	U	1500	62	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1500	U	1500	62	
107-06-2	1,2-Dichloroethane	1500	U	1500	62	
78-87-5	1,2-Dichloropropane	1500	U	1500	77	
71-36-3	n-Butanol	77000	U	77000	4800	
78-93-3	2-Butanone (MEK)	1500	U	1500	210	
591-78-6	2-Hexanone	1500	U	1500	77	
108-10-1	4-Methyl-2-pentanone	1500	U	1500	71	
67-64-1	Acetone	1500	U	1500	350	
71-43-2	Benzene	1500	U	1500	62	
75-27-4	Bromodichloromethane	1500	U	1500	62	
75-25-2	Bromoform	1500	U	1500	74	
74-83-9	Bromomethane	1500	U	1500	130	
75-15-0	Carbon Disulfide	1500	U	1500	280	
56-23-5	Carbon Tetrachloride	1500	U	1500	80	
108-90-7	Chlorobenzene	80	I	1500	62	
75-00-3	Chloroethane	1500	U	1500	120	
67-66-3	Chloroform	1500	U	1500	62	
74-87-3	Chloromethane	1500	U	1500	150	
124-48-1	Dibromochloromethane	1500	U	1500	62	
75-09-2	Dichloromethane	1500	U	1500	83	
100-41-4	Ethylbenzene	1500	U	1500	62	
100-42-5	Styrene	1500	U	1500	62	
127-18-4	Tetrachloroethene (PCE)	1500	U	1500	62	
108-88-3	Toluene	1500	U	1500	62	
79-01-6	Trichloroethene (TCE)	4300		1500	62	
75-01-4	Vinyl Chloride	1700		1500	86	
156-59-2	cis-1,2-Dichloroethene	6200		1500	240	
10061-01-5	cis-1,3-Dichloropropene	1500	U	1500	62	
179601-23-1	m,p-Xylenes	3100	U	3100	210	
123-86-4	n-Butyl Acetate	1500	U	1500	62	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0919
Date Received: 2/15/12
Date Analyzed: 2/24/12 16:03

Sample Name: LC34-DPT0346-045.0-20120213
Lab Code: R1201033-005

Units: µg/Kg
Basis: Dry
Percent Solids: 79.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8521.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 244

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	1500	U	1500	62	
156-60-5	trans-1,2-Dichloroethene	1500	U	1500	71	
10061-02-6	trans-1,3-Dichloropropene	1500	U	1500	62	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	2/24/12 16:03	
Dibromofluoromethane	103	89-119	2/24/12 16:03	
Toluene-d8	106	87-121	2/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-048.0-20120213
Lab Code: R1201033-006

Service Request: R1201033
Date Collected: 2/13/12 0942
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.0		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0942
Date Received: 2/15/12
Date Analyzed: 2/24/12 16:33

Sample Name: LC34-DPT0346-048.0-20120213
Lab Code: R1201033-006

Units: µg/Kg
Basis: Dry
Percent Solids: 72.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8522.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 151.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1100	U	1100	76	
79-34-5	1,1,2,2-Tetrachloroethane	1100	U	1100	43	
79-00-5	1,1,2-Trichloroethane	1100	U	1100	49	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1100	U	1100	43	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1100	U	1100	43	
107-06-2	1,2-Dichloroethane	1100	U	1100	43	
78-87-5	1,2-Dichloropropane	1100	U	1100	53	
71-36-3	n-Butanol	53000	U	53000	3300	
78-93-3	2-Butanone (MEK)	1100	U	1100	140	
591-78-6	2-Hexanone	1100	U	1100	53	
108-10-1	4-Methyl-2-pentanone	1100	U	1100	49	
67-64-1	Acetone	1100	U	1100	240	
71-43-2	Benzene	1100	U	1100	43	
75-27-4	Bromodichloromethane	1100	U	1100	43	
75-25-2	Bromoform	1100	U	1100	51	
74-83-9	Bromomethane	1100	U	1100	87	
75-15-0	Carbon Disulfide	1100	U	1100	190	
56-23-5	Carbon Tetrachloride	1100	U	1100	55	
108-90-7	Chlorobenzene	180	I	1100	43	
75-00-3	Chloroethane	1100	U	1100	80	
67-66-3	Chloroform	1100	U	1100	43	
74-87-3	Chloromethane	1100	U	1100	97	
124-48-1	Dibromochloromethane	1100	U	1100	43	
75-09-2	Dichloromethane	1100	U	1100	57	
100-41-4	Ethylbenzene	1100	U	1100	43	
100-42-5	Styrene	1100	U	1100	43	
127-18-4	Tetrachloroethene (PCE)	1100	U	1100	43	
108-88-3	Toluene	1100	U	1100	43	
79-01-6	Trichloroethene (TCE)	8000		1100	43	
75-01-4	Vinyl Chloride	110	I	1100	59	
156-59-2	cis-1,2-Dichloroethene	23000		1100	170	
10061-01-5	cis-1,3-Dichloropropene	1100	U	1100	43	
179601-23-1	m,p-Xylenes	2100	U	2100	150	
123-86-4	n-Butyl Acetate	1100	U	1100	43	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0942
Date Received: 2/15/12
Date Analyzed: 2/24/12 16:33

Sample Name: LC34-DPT0346-048.0-20120213
Lab Code: R1201033-006

Units: µg/Kg
Basis: Dry
Percent Solids: 72.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8522.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 151.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	1100 U	1100	43	
156-60-5	trans-1,2-Dichloroethene	130 I	1100	49	
10061-02-6	trans-1,3-Dichloropropene	1100 U	1100	43	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/24/12 16:33	
Dibromofluoromethane	102	89-119	2/24/12 16:33	
Toluene-d8	106	87-121	2/24/12 16:33	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-053.0-20120213
Lab Code: R1201033-007

Service Request: R1201033
Date Collected: 2/13/12 0953
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.7	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0953
Date Received: 2/15/12
Date Analyzed: 2/24/12 20:55

Sample Name: LC34-DPT0346-053.0-20120213
Lab Code: R1201033-007

Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022412\J6444.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: .89

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	6.1 U	6.1	0.37	
79-34-5	1,1,2,2-Tetrachloroethane	6.1 U	6.1	0.43	
79-00-5	1,1,2-Trichloroethane	6.1 U	6.1	0.35	
75-34-3	1,1-Dichloroethane (1,1-DCA)	6.1 U	6.1	0.34	
75-35-4	1,1-Dichloroethene (1,1-DCE)	6.1 U	6.1	0.46	
107-06-2	1,2-Dichloroethane	6.1 U	6.1	0.37	
78-87-5	1,2-Dichloropropane	6.1 U	6.1	0.45	
71-36-3	n-Butanol	310 U	310	15	
78-93-3	2-Butanone (MEK)	6.1 U	6.1	2.5	
591-78-6	2-Hexanone	6.1 U	6.1	1.5	
108-10-1	4-Methyl-2-pentanone	6.1 U	6.1	0.52	
67-64-1	Acetone	9.7 V	6.1	1.4	
71-43-2	Benzene	6.1 U	6.1	0.30	
75-27-4	Bromodichloromethane	6.1 U	6.1	0.35	
75-25-2	Bromoform	6.1 U	6.1	0.51	
74-83-9	Bromomethane	6.1 U	6.1	0.47	
75-15-0	Carbon Disulfide	20	6.1	0.35	
56-23-5	Carbon Tetrachloride	6.1 U	6.1	0.94	
108-90-7	Chlorobenzene	0.84 I	6.1	0.40	
75-00-3	Chloroethane	6.1 U	6.1	0.53	
67-66-3	Chloroform	6.1 U	6.1	0.65	
74-87-3	Chloromethane	6.1 U	6.1	0.54	
124-48-1	Dibromochloromethane	6.1 U	6.1	0.43	
75-09-2	Dichloromethane	6.1 U	6.1	0.27	
100-41-4	Ethylbenzene	6.1 U	6.1	0.52	
100-42-5	Styrene	6.1 U	6.1	0.38	
127-18-4	Tetrachloroethene (PCE)	6.1 U	6.1	0.70	
108-88-3	Toluene	1.7 I	6.1	0.38	
79-01-6	Trichloroethene (TCE)	6.1 U	6.1	0.63	
75-01-4	Vinyl Chloride	9.8	6.1	0.58	
156-59-2	cis-1,2-Dichloroethene	0.59 I	6.1	0.46	
10061-01-5	cis-1,3-Dichloropropene	6.1 U	6.1	0.43	
179601-23-1	m,p-Xylenes	12 U	12	0.85	
123-86-4	n-Butyl Acetate	6.1 U	6.1	0.56	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 0953
Date Received: 2/15/12
Date Analyzed: 2/24/12 20:55

Sample Name: LC34-DPT0346-053.0-20120213
Lab Code: R1201033-007

Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022412\J6444.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: .89

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	6.1 U	6.1	0.38	
156-60-5	trans-1,2-Dichloroethene	0.77 I	6.1	0.47	
10061-02-6	trans-1,3-Dichloropropene	6.1 U	6.1	0.25	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	77-128	2/24/12 20:55	
Dibromofluoromethane	96	65-136	2/24/12 20:55	
Toluene-d8	104	75-126	2/24/12 20:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0346-055.0-20120213
Lab Code: R1201033-008

Service Request: R1201033
Date Collected: 2/13/12 1006
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	71.4	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1006
Date Received: 2/15/12
Date Analyzed: 2/25/12 16:19

Sample Name: LC34-DPT0346-055.0-20120213
Lab Code: R1201033-008

Units: µg/Kg
Basis: Dry
Percent Solids: 71.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6458.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .69

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	4.8 U	4.8	0.29	
79-34-5	1,1,2,2-Tetrachloroethane	4.8 U	4.8	0.34	
79-00-5	1,1,2-Trichloroethane	4.8 U	4.8	0.28	
75-34-3	1,1-Dichloroethane (1,1-DCA)	4.8 U	4.8	0.27	
75-35-4	1,1-Dichloroethene (1,1-DCE)	4.8 U	4.8	0.36	
107-06-2	1,2-Dichloroethane	4.8 U	4.8	0.29	
78-87-5	1,2-Dichloropropane	4.8 U	4.8	0.35	
71-36-3	n-Butanol	240 U	240	12	
78-93-3	2-Butanone (MEK)	4.8 U	4.8	2.0	
591-78-6	2-Hexanone	4.8 U	4.8	1.2	
108-10-1	4-Methyl-2-pentanone	4.8 U	4.8	0.41	
67-64-1	Acetone	7.4	4.8	1.1	
71-43-2	Benzene	4.8 U	4.8	0.24	
75-27-4	Bromodichloromethane	4.8 U	4.8	0.28	
75-25-2	Bromoform	4.8 U	4.8	0.40	
74-83-9	Bromomethane	4.8 U	4.8	0.37	
75-15-0	Carbon Disulfide	10	4.8	0.28	
56-23-5	Carbon Tetrachloride	4.8 U	4.8	0.74	
108-90-7	Chlorobenzene	0.41 I	4.8	0.31	
75-00-3	Chloroethane	4.8 U	4.8	0.42	
67-66-3	Chloroform	4.8 U	4.8	0.52	
74-87-3	Chloromethane	4.8 U	4.8	0.43	
124-48-1	Dibromochloromethane	4.8 U	4.8	0.34	
75-09-2	Dichloromethane	4.8 U	4.8	0.22	
100-41-4	Ethylbenzene	4.8 U	4.8	0.41	
100-42-5	Styrene	4.8 U	4.8	0.30	
127-18-4	Tetrachloroethene (PCE)	4.8 U	4.8	0.56	
108-88-3	Toluene	0.56 I	4.8	0.30	
79-01-6	Trichloroethene (TCE)	4.8 U	4.8	0.50	
75-01-4	Vinyl Chloride	3.3 I	4.8	0.46	
156-59-2	cis-1,2-Dichloroethene	1.0 I	4.8	0.36	
10061-01-5	cis-1,3-Dichloropropene	4.8 U	4.8	0.34	
179601-23-1	m,p-Xylenes	9.7 U	9.7	0.67	
123-86-4	n-Butyl Acetate	4.8 U	4.8	0.44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1006
Date Received: 2/15/12
Date Analyzed: 2/25/12 16:19

Sample Name: LC34-DPT0346-055.0-20120213
Lab Code: R1201033-008

Units: µg/Kg
Basis: Dry
Percent Solids: 71.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6458.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .69

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	4.8 U	4.8	0.30	
156-60-5	trans-1,2-Dichloroethene	0.60 I	4.8	0.37	
10061-02-6	trans-1,3-Dichloropropene	4.8 U	4.8	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	77-128	2/25/12 16:19	
Dibromofluoromethane	94	65-136	2/25/12 16:19	
Toluene-d8	104	75-126	2/25/12 16:19	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-037.0-20120213
Lab Code: R1201033-009

Service Request: R1201033
Date Collected: 2/13/12 1035
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.0	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1035
Date Received: 2/15/12
Date Analyzed: 2/24/12 17:03

Sample Name: LC34-DPT0347-037.0-20120213
Lab Code: R1201033-009

Units: µg/Kg
Basis: Dry
Percent Solids: 72.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8523.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 103.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	720 U	720	52	
79-34-5	1,1,2,2-Tetrachloroethane	720 U	720	29	
79-00-5	1,1,2-Trichloroethane	720 U	720	34	
75-34-3	1,1-Dichloroethane (1,1-DCA)	720 U	720	29	
75-35-4	1,1-Dichloroethene (1,1-DCE)	720 U	720	29	
107-06-2	1,2-Dichloroethane	720 U	720	29	
78-87-5	1,2-Dichloropropane	720 U	720	36	
71-36-3	n-Butanol	36000 U	36000	2300	
78-93-3	2-Butanone (MEK)	720 U	720	95	
591-78-6	2-Hexanone	720 U	720	36	
108-10-1	4-Methyl-2-pentanone	720 U	720	34	
67-64-1	Acetone	720 U	720	170	
71-43-2	Benzene	720 U	720	29	
75-27-4	Bromodichloromethane	720 U	720	29	
75-25-2	Bromoform	720 U	720	35	
74-83-9	Bromomethane	720 U	720	59	
75-15-0	Carbon Disulfide	720 U	720	130	
56-23-5	Carbon Tetrachloride	720 U	720	38	
108-90-7	Chlorobenzene	81 I	720	29	
75-00-3	Chloroethane	720 U	720	55	
67-66-3	Chloroform	720 U	720	29	
74-87-3	Chloromethane	720 U	720	67	
124-48-1	Dibromochloromethane	720 U	720	29	
75-09-2	Dichloromethane	720 U	720	39	
100-41-4	Ethylbenzene	720 U	720	29	
100-42-5	Styrene	720 U	720	29	
127-18-4	Tetrachloroethene (PCE)	720 U	720	29	
108-88-3	Toluene	720 U	720	29	
79-01-6	Trichloroethene (TCE)	4400	720	29	
75-01-4	Vinyl Chloride	850	720	41	
156-59-2	cis-1,2-Dichloroethene	840	720	120	
10061-01-5	cis-1,3-Dichloropropene	720 U	720	29	
179601-23-1	m,p-Xylenes	1400 U	1400	97	
123-86-4	n-Butyl Acetate	720 U	720	29	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1035
Date Received: 2/15/12
Date Analyzed: 2/24/12 17:03

Sample Name: LC34-DPT0347-037.0-20120213
Lab Code: R1201033-009

Units: µg/Kg
Basis: Dry
Percent Solids: 72.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8523.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 103.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	720 U	720	29	
156-60-5	trans-1,2-Dichloroethene	720 U	720	34	
10061-02-6	trans-1,3-Dichloropropene	720 U	720	29	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	2/24/12 17:03	
Dibromofluoromethane	103	89-119	2/24/12 17:03	
Toluene-d8	106	87-121	2/24/12 17:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-040.0-20120213
Lab Code: R1201033-010

Service Request: R1201033
Date Collected: 2/13/12 1045
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	79.3	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1045
Date Received: 2/15/12
Date Analyzed: 2/24/12 17:33

Sample Name: LC34-DPT0347-040.0-20120213
Lab Code: R1201033-010

Units: µg/Kg
Basis: Dry
Percent Solids: 79.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8524.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 102.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	650 U	650	47	
79-34-5	1,1,2,2-Tetrachloroethane	650 U	650	26	
79-00-5	1,1,2-Trichloroethane	650 U	650	30	
75-34-3	1,1-Dichloroethane (1,1-DCA)	650 U	650	26	
75-35-4	1,1-Dichloroethene (1,1-DCE)	650 U	650	26	
107-06-2	1,2-Dichloroethane	650 U	650	26	
78-87-5	1,2-Dichloropropane	650 U	650	33	
71-36-3	n-Butanol	32000 U	32000	2000	
78-93-3	2-Butanone (MEK)	650 U	650	86	
591-78-6	2-Hexanone	650 U	650	33	
108-10-1	4-Methyl-2-pentanone	650 U	650	30	
67-64-1	Acetone	650 U	650	150	
71-43-2	Benzene	650 U	650	26	
75-27-4	Bromodichloromethane	650 U	650	26	
75-25-2	Bromoform	650 U	650	32	
74-83-9	Bromomethane	650 U	650	53	
75-15-0	Carbon Disulfide	650 U	650	120	
56-23-5	Carbon Tetrachloride	650 U	650	34	
108-90-7	Chlorobenzene	93 I	650	26	
75-00-3	Chloroethane	650 U	650	50	
67-66-3	Chloroform	650 U	650	26	
74-87-3	Chloromethane	650 U	650	60	
124-48-1	Dibromochloromethane	650 U	650	26	
75-09-2	Dichloromethane	650 U	650	35	
100-41-4	Ethylbenzene	650 U	650	26	
100-42-5	Styrene	650 U	650	26	
127-18-4	Tetrachloroethene (PCE)	650 U	650	26	
108-88-3	Toluene	650 U	650	26	
79-01-6	Trichloroethene (TCE)	2600	650	26	
75-01-4	Vinyl Chloride	690	650	37	
156-59-2	cis-1,2-Dichloroethene	680	650	110	
10061-01-5	cis-1,3-Dichloropropene	650 U	650	26	
179601-23-1	m,p-Xylenes	1300 U	1300	87	
123-86-4	n-Butyl Acetate	650 U	650	26	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1045
Date Received: 2/15/12
Date Analyzed: 2/24/12 17:33

Sample Name: LC34-DPT0347-040.0-20120213
Lab Code: R1201033-010

Units: µg/Kg
Basis: Dry
Percent Solids: 79.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8524.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 102.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	650 U	650	26	
156-60-5	trans-1,2-Dichloroethene	650 U	650	30	
10061-02-6	trans-1,3-Dichloropropene	650 U	650	26	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	2/24/12 17:33	
Dibromofluoromethane	103	89-119	2/24/12 17:33	
Toluene-d8	105	87-121	2/24/12 17:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-045.5-20120213
Lab Code: R1201033-011

Service Request: R1201033
Date Collected: 2/13/12 1055
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.7	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1055
Date Received: 2/15/12
Date Analyzed: 2/25/12 19:54

Sample Name: LC34-DPT0347-045.5-20120213
Lab Code: R1201033-011

Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6464.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .8

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.5 U	5.5	0.34	
79-34-5	1,1,2,2-Tetrachloroethane	5.5 U	5.5	0.39	
79-00-5	1,1,2-Trichloroethane	5.5 U	5.5	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.5 U	5.5	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.5 U	5.5	0.41	
107-06-2	1,2-Dichloroethane	5.5 U	5.5	0.34	
78-87-5	1,2-Dichloropropane	5.5 U	5.5	0.40	
71-36-3	n-Butanol	280 U	280	13	
78-93-3	2-Butanone (MEK)	2.8 I	5.5	2.3	
591-78-6	2-Hexanone	5.5 U	5.5	1.3	
108-10-1	4-Methyl-2-pentanone	5.5 U	5.5	0.47	
67-64-1	Acetone	20	5.5	1.3	
71-43-2	Benzene	5.5 U	5.5	0.27	
75-27-4	Bromodichloromethane	5.5 U	5.5	0.31	
75-25-2	Bromoform	5.5 U	5.5	0.46	
74-83-9	Bromomethane	5.5 U	5.5	0.42	
75-15-0	Carbon Disulfide	27	5.5	0.31	
56-23-5	Carbon Tetrachloride	5.5 U	5.5	0.84	
108-90-7	Chlorobenzene	5.5 U	5.5	0.36	
75-00-3	Chloroethane	5.5 U	5.5	0.48	
67-66-3	Chloroform	5.5 U	5.5	0.59	
74-87-3	Chloromethane	5.5 U	5.5	0.54	
124-48-1	Dibromochloromethane	5.5 U	5.5	0.39	
75-09-2	Dichloromethane	0.33 I	5.5	0.25	
100-41-4	Ethylbenzene	5.5 U	5.5	0.47	
100-42-5	Styrene	5.5 U	5.5	0.35	
127-18-4	Tetrachloroethene (PCE)	5.5 U	5.5	0.63	
108-88-3	Toluene	1.1 I	5.5	0.35	
79-01-6	Trichloroethene (TCE)	170	5.5	0.57	
75-01-4	Vinyl Chloride	22	5.5	0.52	
156-59-2	cis-1,2-Dichloroethene	130	5.5	0.41	
10061-01-5	cis-1,3-Dichloropropene	5.5 U	5.5	0.39	
179601-23-1	m,p-Xylenes	11 U	11	0.76	
123-86-4	n-Butyl Acetate	1.1 I	5.5	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1055
Date Received: 2/15/12
Date Analyzed: 2/25/12 19:54

Sample Name: LC34-DPT0347-045.5-20120213
Lab Code: R1201033-011

Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6464.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .8

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	5.5 U	5.5	0.35	
156-60-5	trans-1,2-Dichloroethene	2.3 I	5.5	0.42	
10061-02-6	trans-1,3-Dichloropropene	5.5 U	5.5	0.23	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	77-128	2/25/12 19:54	
Dibromofluoromethane	97	65-136	2/25/12 19:54	
Toluene-d8	105	75-126	2/25/12 19:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-047.0-20120213
Lab Code: R1201033-012

Service Request: R1201033
Date Collected: 2/13/12 1107
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	76.1	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1107
Date Received: 2/15/12
Date Analyzed: 2/24/12 19:18

Sample Name: LC34-DPT0347-047.0-20120213
Lab Code: R1201033-012

Units: µg/Kg
Basis: Dry
Percent Solids: 76.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\022412\D8525.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 382.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	190	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	110	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	120	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	110	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	110	
107-06-2	1,2-Dichloroethane	2500	U	2500	110	
78-87-5	1,2-Dichloropropane	2500	U	2500	130	
71-36-3	n-Butanol	130000	U	130000	7800	
78-93-3	2-Butanone (MEK)	2500	U	2500	340	
591-78-6	2-Hexanone	2500	U	2500	130	
108-10-1	4-Methyl-2-pentanone	2500	U	2500	120	
67-64-1	Acetone	2500	U	2500	570	
71-43-2	Benzene	2500	U	2500	110	
75-27-4	Bromodichloromethane	2500	U	2500	110	
75-25-2	Bromoform	2500	U	2500	130	
74-83-9	Bromomethane	2500	U	2500	210	
75-15-0	Carbon Disulfide	2500	U	2500	460	
56-23-5	Carbon Tetrachloride	2500	U	2500	140	
108-90-7	Chlorobenzene	710	I	2500	110	
75-00-3	Chloroethane	2500	U	2500	200	
67-66-3	Chloroform	2500	U	2500	110	
74-87-3	Chloromethane	2500	U	2500	240	
124-48-1	Dibromochloromethane	2500	U	2500	110	
75-09-2	Dichloromethane	2500	U	2500	140	
100-41-4	Ethylbenzene	2500	U	2500	110	
100-42-5	Styrene	2500	U	2500	110	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	110	
108-88-3	Toluene	2500	U	2500	110	
79-01-6	Trichloroethene (TCE)	73000		2500	110	
75-01-4	Vinyl Chloride	170	I	2500	150	
156-59-2	cis-1,2-Dichloroethene	7500		2500	400	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	110	
179601-23-1	m,p-Xylenes	5000	U	5000	340	
123-86-4	n-Butyl Acetate	2500	U	2500	110	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1107
Date Received: 2/15/12
Date Analyzed: 2/24/12 19:18

Sample Name: LC34-DPT0347-047.0-20120213
Lab Code: R1201033-012

Units: µg/Kg
Basis: Dry
Percent Solids: 76.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\022412\D8525.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 382.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	2500	U	2500	110	
156-60-5	trans-1,2-Dichloroethene	2500	U	2500	120	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	110	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	2/24/12 19:18	
Dibromofluoromethane	104	89-119	2/24/12 19:18	
Toluene-d8	106	87-121	2/24/12 19:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-050.0-20120213
Lab Code: R1201033-013

Service Request: R1201033
Date Collected: 2/13/12 1115
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	69.5		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1115
Date Received: 2/15/12
Date Analyzed: 2/24/12 19:48

Sample Name: LC34-DPT0347-050.0-20120213
Lab Code: R1201033-013

Units: µg/Kg
Basis: Dry
Percent Solids: 69.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8526.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 502

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	3600	U	3600	270	
79-34-5	1,1,2,2-Tetrachloroethane	3600	U	3600	150	
79-00-5	1,1,2-Trichloroethane	3600	U	3600	170	
75-34-3	1,1-Dichloroethane (1,1-DCA)	3600	U	3600	150	
75-35-4	1,1-Dichloroethene (1,1-DCE)	3600	U	3600	150	
107-06-2	1,2-Dichloroethane	3600	U	3600	150	
78-87-5	1,2-Dichloropropane	3600	U	3600	190	
71-36-3	n-Butanol	180000	U	180000	12000	
78-93-3	2-Butanone (MEK)	3600	U	3600	480	
591-78-6	2-Hexanone	3600	U	3600	190	
108-10-1	4-Methyl-2-pentanone	3600	U	3600	170	
67-64-1	Acetone	3600	U	3600	810	
71-43-2	Benzene	3600	U	3600	150	
75-27-4	Bromodichloromethane	3600	U	3600	150	
75-25-2	Bromoform	3600	U	3600	180	
74-83-9	Bromomethane	3600	U	3600	300	
75-15-0	Carbon Disulfide	3600	U	3600	660	
56-23-5	Carbon Tetrachloride	3600	U	3600	190	
108-90-7	Chlorobenzene	270	I	3600	150	
75-00-3	Chloroethane	3600	U	3600	280	
67-66-3	Chloroform	3600	U	3600	150	
74-87-3	Chloromethane	3600	U	3600	340	
124-48-1	Dibromochloromethane	3600	U	3600	150	
75-09-2	Dichloromethane	3600	U	3600	200	
100-41-4	Ethylbenzene	3600	U	3600	150	
100-42-5	Styrene	3600	U	3600	150	
127-18-4	Tetrachloroethene (PCE)	3600	U	3600	150	
108-88-3	Toluene	3600	U	3600	150	
79-01-6	Trichloroethene (TCE)	69000		3600	150	
75-01-4	Vinyl Chloride	3600	U	3600	210	
156-59-2	cis-1,2-Dichloroethene	3600	I	3600	570	
10061-01-5	cis-1,3-Dichloropropene	3600	U	3600	150	
179601-23-1	m,p-Xylenes	7200	U	7200	490	
123-86-4	n-Butyl Acetate	3600	U	3600	150	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1115
Date Received: 2/15/12
Date Analyzed: 2/24/12 19:48

Sample Name: LC34-DPT0347-050.0-20120213
Lab Code: R1201033-013

Units: µg/Kg
Basis: Dry
Percent Solids: 69.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8526.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 502

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	3600 U	3600	150	
156-60-5	trans-1,2-Dichloroethene	3600 U	3600	170	
10061-02-6	trans-1,3-Dichloropropene	3600 U	3600	150	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/24/12 19:48	
Dibromofluoromethane	103	89-119	2/24/12 19:48	
Toluene-d8	106	87-121	2/24/12 19:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-050.5-20120213
Lab Code: R1201033-014

Service Request: R1201033
Date Collected: 2/13/12 1126
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	76.5	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1126
Date Received: 2/15/12
Date Analyzed: 2/25/12 16:55

Sample Name: LC34-DPT0347-050.5-20120213
Lab Code: R1201033-014

Units: µg/Kg
Basis: Dry
Percent Solids: 76.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6459.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .83

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.4 U	5.4	0.33	
79-34-5	1,1,2,2-Tetrachloroethane	5.4 U	5.4	0.38	
79-00-5	1,1,2-Trichloroethane	5.4 U	5.4	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.4 U	5.4	0.30	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.4 U	5.4	0.41	
107-06-2	1,2-Dichloroethane	5.4 U	5.4	0.33	
78-87-5	1,2-Dichloropropane	5.4 U	5.4	0.40	
71-36-3	n-Butanol	270 U	270	13	
78-93-3	2-Butanone (MEK)	2.7 I	5.4	2.2	
591-78-6	2-Hexanone	5.4 U	5.4	1.3	
108-10-1	4-Methyl-2-pentanone	5.4 U	5.4	0.46	
67-64-1	Acetone	14	5.4	1.2	
71-43-2	Benzene	5.4 U	5.4	0.27	
75-27-4	Bromodichloromethane	5.4 U	5.4	0.31	
75-25-2	Bromoform	5.4 U	5.4	0.45	
74-83-9	Bromomethane	5.4 U	5.4	0.42	
75-15-0	Carbon Disulfide	23	5.4	0.31	
56-23-5	Carbon Tetrachloride	5.4 U	5.4	0.83	
108-90-7	Chlorobenzene	5.4 U	5.4	0.35	
75-00-3	Chloroethane	5.4 U	5.4	0.47	
67-66-3	Chloroform	5.4 U	5.4	0.58	
74-87-3	Chloromethane	5.4 U	5.4	0.48	
124-48-1	Dibromochloromethane	5.4 U	5.4	0.38	
75-09-2	Dichloromethane	5.4 U	5.4	0.24	
100-41-4	Ethylbenzene	5.4 U	5.4	0.46	
100-42-5	Styrene	5.4 U	5.4	0.34	
127-18-4	Tetrachloroethene (PCE)	5.4 U	5.4	0.62	
108-88-3	Toluene	0.59 I	5.4	0.34	
79-01-6	Trichloroethene (TCE)	1.6 I	5.4	0.56	
75-01-4	Vinyl Chloride	13	5.4	0.51	
156-59-2	cis-1,2-Dichloroethene	1.7 I	5.4	0.41	
10061-01-5	cis-1,3-Dichloropropene	5.4 U	5.4	0.38	
179601-23-1	m,p-Xylenes	11 U	11	0.75	
123-86-4	n-Butyl Acetate	5.4 U	5.4	0.49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1126
Date Received: 2/15/12
Date Analyzed: 2/25/12 16:55

Sample Name: LC34-DPT0347-050.5-20120213
Lab Code: R1201033-014

Units: µg/Kg
Basis: Dry
Percent Solids: 76.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\022512\J6459.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .83

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	5.4	U	5.4	0.34	
156-60-5	trans-1,2-Dichloroethene	5.4	U	5.4	0.42	
10061-02-6	trans-1,3-Dichloropropene	5.4	U	5.4	0.22	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	77-128	2/25/12 16:55	
Dibromofluoromethane	92	65-136	2/25/12 16:55	
Toluene-d8	106	75-126	2/25/12 16:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0347-053.0-20120213
Lab Code: R1201033-015

Service Request: R1201033
Date Collected: 2/13/12 1135
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Solids, Total	160.3 Modified	81.2		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1135
Date Received: 2/15/12
Date Analyzed: 2/25/12 17:31

Sample Name: LC34-DPT0347-053.0-20120213
Lab Code: R1201033-015

Units: µg/Kg
Basis: Dry
Percent Solids: 81.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6460.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .84

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.2 U	5.2	0.32	
79-34-5	1,1,2,2-Tetrachloroethane	5.2 U	5.2	0.37	
79-00-5	1,1,2-Trichloroethane	5.2 U	5.2	0.29	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.2 U	5.2	0.28	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.2 U	5.2	0.39	
107-06-2	1,2-Dichloroethane	5.2 U	5.2	0.32	
78-87-5	1,2-Dichloropropane	5.2 U	5.2	0.38	
71-36-3	n-Butanol	260 U	260	12	
78-93-3	2-Butanone (MEK)	2.9 I	5.2	2.1	
591-78-6	2-Hexanone	5.2 U	5.2	1.2	
108-10-1	4-Methyl-2-pentanone	5.2 U	5.2	0.44	
67-64-1	Acetone	12	5.2	1.2	
71-43-2	Benzene	5.2 U	5.2	0.25	
75-27-4	Bromodichloromethane	5.2 U	5.2	0.29	
75-25-2	Bromoform	5.2 U	5.2	0.43	
74-83-9	Bromomethane	5.2 U	5.2	0.40	
75-15-0	Carbon Disulfide	34	5.2	0.29	
56-23-5	Carbon Tetrachloride	5.2 U	5.2	0.79	
108-90-7	Chlorobenzene	5.2 U	5.2	0.34	
75-00-3	Chloroethane	5.2 U	5.2	0.45	
67-66-3	Chloroform	5.2 U	5.2	0.55	
74-87-3	Chloromethane	5.2 U	5.2	0.46	
124-48-1	Dibromochloromethane	5.2 U	5.2	0.37	
75-09-2	Dichloromethane	5.2 U	5.2	0.23	
100-41-4	Ethylbenzene	5.2 U	5.2	0.44	
100-42-5	Styrene	5.2 U	5.2	0.33	
127-18-4	Tetrachloroethene (PCE)	5.2 U	5.2	0.59	
108-88-3	Toluene	0.55 I	5.2	0.33	
79-01-6	Trichloroethene (TCE)	1.6 I	5.2	0.53	
75-01-4	Vinyl Chloride	12	5.2	0.49	
156-59-2	cis-1,2-Dichloroethene	1.4 I	5.2	0.39	
10061-01-5	cis-1,3-Dichloropropene	5.2 U	5.2	0.37	
179601-23-1	m,p-Xylenes	10 U	10	0.72	
123-86-4	n-Butyl Acetate	5.2 U	5.2	0.47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1135
Date Received: 2/15/12
Date Analyzed: 2/25/12 17:31

Sample Name: LC34-DPT0347-053.0-20120213
Lab Code: R1201033-015

Units: µg/Kg
Basis: Dry
Percent Solids: 81.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6460.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .84

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	5.2 U	5.2	0.33	
156-60-5	trans-1,2-Dichloroethene	0.52 I	5.2	0.40	
10061-02-6	trans-1,3-Dichloropropene	5.2 U	5.2	0.21	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	77-128	2/25/12 17:31	
Dibromofluoromethane	95	65-136	2/25/12 17:31	
Toluene-d8	101	75-126	2/25/12 17:31	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-034.5-20120213
Lab Code: R1201033-016

Service Request: R1201033
Date Collected: 2/13/12 1250
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	82.3		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1250
Date Received: 2/15/12
Date Analyzed: 2/24/12 20:47

Sample Name: LC34-DPT0348-034.5-20120213
Lab Code: R1201033-016

Units: µg/Kg
Basis: Dry
Percent Solids: 82.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022412\D8528.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 106.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	650	U	650	47	
79-34-5	1,1,2,2-Tetrachloroethane	650	U	650	26	
79-00-5	1,1,2-Trichloroethane	650	U	650	30	
75-34-3	1,1-Dichloroethane (1,1-DCA)	650	U	650	26	
75-35-4	1,1-Dichloroethene (1,1-DCE)	650	U	650	26	
107-06-2	1,2-Dichloroethane	650	U	650	26	
78-87-5	1,2-Dichloropropane	650	U	650	33	
71-36-3	n-Butanol	32000	U	32000	2000	
78-93-3	2-Butanone (MEK)	650	U	650	86	
591-78-6	2-Hexanone	650	U	650	33	
108-10-1	4-Methyl-2-pentanone	650	U	650	30	
67-64-1	Acetone	650	U	650	150	
71-43-2	Benzene	650	U	650	26	
75-27-4	Bromodichloromethane	650	U	650	26	
75-25-2	Bromoform	650	U	650	32	
74-83-9	Bromomethane	650	U	650	54	
75-15-0	Carbon Disulfide	650	U	650	120	
56-23-5	Carbon Tetrachloride	650	U	650	34	
108-90-7	Chlorobenzene	72	I	650	26	
75-00-3	Chloroethane	650	U	650	50	
67-66-3	Chloroform	650	U	650	26	
74-87-3	Chloromethane	650	U	650	60	
124-48-1	Dibromochloromethane	650	U	650	26	
75-09-2	Dichloromethane	650	U	650	35	
100-41-4	Ethylbenzene	650	U	650	26	
100-42-5	Styrene	650	U	650	26	
127-18-4	Tetrachloroethene (PCE)	650	U	650	26	
108-88-3	Toluene	650	U	650	26	
79-01-6	Trichloroethene (TCE)	62	I	650	26	
75-01-4	Vinyl Chloride	290	I	650	37	
156-59-2	cis-1,2-Dichloroethene	5800		650	110	
10061-01-5	cis-1,3-Dichloropropene	650	U	650	26	
179601-23-1	m,p-Xylenes	1300	U	1300	87	
123-86-4	n-Butyl Acetate	650	U	650	26	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1250
Date Received: 2/15/12
Date Analyzed: 2/24/12 20:47

Sample Name: LC34-DPT0348-034.5-20120213
Lab Code: R1201033-016

Units: µg/Kg
Basis: Dry
Percent Solids: 82.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\msvoa10\data\022412\D8528.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 106.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	650 U	650	26	
156-60-5	trans-1,2-Dichloroethene	120 I	650	30	
10061-02-6	trans-1,3-Dichloropropene	650 U	650	26	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/24/12 20:47	
Dibromofluoromethane	103	89-119	2/24/12 20:47	
Toluene-d8	106	87-121	2/24/12 20:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-037.0-20120213
Lab Code: R1201033-017

Service Request: R1201033
Date Collected: 2/13/12 1300
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	68.3	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1300
Date Received: 2/15/12
Date Analyzed: 2/25/12 17:33

Sample Name: LC34-DPT0348-037.0-20120213
Lab Code: R1201033-017

Units: µg/Kg
Basis: Dry
Percent Solids: 68.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6591.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 77

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	560	U	560	41	
79-34-5	1,1,2,2-Tetrachloroethane	560	U	560	23	
79-00-5	1,1,2-Trichloroethane	560	U	560	26	
75-34-3	1,1-Dichloroethane (1,1-DCA)	560	U	560	23	
75-35-4	1,1-Dichloroethene (1,1-DCE)	560	U	560	23	
107-06-2	1,2-Dichloroethane	560	U	560	23	
78-87-5	1,2-Dichloropropane	560	U	560	29	
71-36-3	n-Butanol	28000	U	28000	1800	
78-93-3	2-Butanone (MEK)	560	U	560	75	
591-78-6	2-Hexanone	560	U	560	29	
108-10-1	4-Methyl-2-pentanone	560	U	560	26	
67-64-1	Acetone	560	U	560	130	
71-43-2	Benzene	560	U	560	23	
75-27-4	Bromodichloromethane	560	U	560	23	
75-25-2	Bromoform	560	U	560	28	
74-83-9	Bromomethane	560	U	560	47	
75-15-0	Carbon Disulfide	560	U	560	110	
56-23-5	Carbon Tetrachloride	560	U	560	30	
108-90-7	Chlorobenzene	73	I	560	23	
75-00-3	Chloroethane	560	U	560	43	
67-66-3	Chloroform	560	U	560	23	
74-87-3	Chloromethane	560	U	560	52	
124-48-1	Dibromochloromethane	560	U	560	23	
75-09-2	Dichloromethane	560	U	560	31	
100-41-4	Ethylbenzene	560	U	560	23	
100-42-5	Styrene	560	U	560	23	
127-18-4	Tetrachloroethene (PCE)	560	U	560	23	
108-88-3	Toluene	560	U	560	23	
79-01-6	Trichloroethene (TCE)	30	I	560	23	
75-01-4	Vinyl Chloride	3700		560	32	
156-59-2	cis-1,2-Dichloroethene	260	I	560	88	
10061-01-5	cis-1,3-Dichloropropene	560	U	560	23	
179601-23-1	m,p-Xylenes	1100	U	1100	76	
123-86-4	n-Butyl Acetate	560	U	560	23	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1300
Date Received: 2/15/12
Date Analyzed: 2/25/12 17:33

Sample Name: LC34-DPT0348-037.0-20120213
Lab Code: R1201033-017

Units: µg/Kg
Basis: Dry
Percent Solids: 68.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6591.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 77

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	560	U	560	23	
156-60-5	trans-1,2-Dichloroethene	52	I	560	26	
10061-02-6	trans-1,3-Dichloropropene	560	U	560	23	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/25/12 17:33	
Dibromofluoromethane	97	89-119	2/25/12 17:33	
Toluene-d8	95	87-121	2/25/12 17:33	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-040.0-20120213
Lab Code: R1201033-018

Service Request: R1201033
Date Collected: 2/13/12 1311
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	86.5	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1311
Date Received: 2/15/12
Date Analyzed: 2/25/12 18:04

Sample Name: LC34-DPT0348-040.0-20120213
Lab Code: R1201033-018

Units: µg/Kg
Basis: Dry
Percent Solids: 86.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6592.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 120.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	700	U	700	51	
79-34-5	1,1,2,2-Tetrachloroethane	700	U	700	28	
79-00-5	1,1,2-Trichloroethane	700	U	700	33	
75-34-3	1,1-Dichloroethane (1,1-DCA)	700	U	700	28	
75-35-4	1,1-Dichloroethene (1,1-DCE)	700	U	700	28	
107-06-2	1,2-Dichloroethane	700	U	700	28	
78-87-5	1,2-Dichloropropane	700	U	700	35	
71-36-3	n-Butanol	35000	U	35000	2200	
78-93-3	2-Butanone (MEK)	700	U	700	92	
591-78-6	2-Hexanone	700	U	700	35	
108-10-1	4-Methyl-2-pentanone	700	U	700	33	
67-64-1	Acetone	700	U	700	160	
71-43-2	Benzene	700	U	700	28	
75-27-4	Bromodichloromethane	700	U	700	28	
75-25-2	Bromoform	700	U	700	34	
74-83-9	Bromomethane	61	I	700	58	
75-15-0	Carbon Disulfide	700	U	700	130	
56-23-5	Carbon Tetrachloride	700	U	700	37	
108-90-7	Chlorobenzene	77	I	700	28	
75-00-3	Chloroethane	700	U	700	53	
67-66-3	Chloroform	700	U	700	28	
74-87-3	Chloromethane	700	U	700	65	
124-48-1	Dibromochloromethane	700	U	700	28	
75-09-2	Dichloromethane	700	U	700	38	
100-41-4	Ethylbenzene	700	U	700	28	
100-42-5	Styrene	700	U	700	28	
127-18-4	Tetrachloroethene (PCE)	700	U	700	28	
108-88-3	Toluene	700	U	700	28	
79-01-6	Trichloroethene (TCE)	670	I	700	28	
75-01-4	Vinyl Chloride	900		700	40	
156-59-2	cis-1,2-Dichloroethene	2500		700	110	
10061-01-5	cis-1,3-Dichloropropene	700	U	700	28	
179601-23-1	m,p-Xylenes	1400	U	1400	94	
123-86-4	n-Butyl Acetate	700	U	700	28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1311
Date Received: 2/15/12
Date Analyzed: 2/25/12 18:04

Sample Name: LC34-DPT0348-040.0-20120213
Lab Code: R1201033-018

Units: µg/Kg
Basis: Dry
Percent Solids: 86.5

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6592.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 120.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	700	U	700	28	
156-60-5	trans-1,2-Dichloroethene	700	U	700	33	
10061-02-6	trans-1,3-Dichloropropene	700	U	700	28	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	2/25/12 18:04	
Dibromofluoromethane	97	89-119	2/25/12 18:04	
Toluene-d8	97	87-121	2/25/12 18:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-045.5-20120213
Lab Code: R1201033-019

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-045.5-20120213
Lab Code: R1201033-019

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	730	U	730	45	106.5	NA	2/25/12 18:34		281447	
1,1,2,2-Tetrachloroethane	730	U	730	52	106.5	NA	2/25/12 18:34		281447	
1,1,2-Trichloroethane	730	U	730	42	106.5	NA	2/25/12 18:34		281447	
1,1-Dichloroethane (1,1-DCA)	730	U	730	40	106.5	NA	2/25/12 18:34		281447	
1,1-Dichloroethene (1,1-DCE)	730	U	730	55	106.5	NA	2/25/12 18:34		281447	
1,2-Dichloroethane	730	U	730	45	106.5	NA	2/25/12 18:34		281447	
1,2-Dichloropropane	730	U	730	53	106.5	NA	2/25/12 18:34		281447	
n-Butanol	37000	U	37000	1700	106.5	NA	2/25/12 18:34		281447	
2-Butanone (MEK)	730	U	730	300	106.5	NA	2/25/12 18:34		281447	
2-Hexanone	730	U	730	180	106.5	NA	2/25/12 18:34		281447	
4-Methyl-2-pentanone	730	U	730	62	106.5	NA	2/25/12 18:34		281447	
Acetone	730	U	730	170	106.5	NA	2/25/12 18:34		281447	
Benzene	730	U	730	36	106.5	NA	2/25/12 18:34		281447	
Bromodichloromethane	730	U	730	42	106.5	NA	2/25/12 18:34		281447	
Bromoform	730	U	730	61	106.5	NA	2/25/12 18:34		281447	
Bromomethane	97	I	730	56	106.5	NA	2/25/12 18:34		281447	
Carbon Disulfide	730	U	730	42	106.5	NA	2/25/12 18:34		281447	
Carbon Tetrachloride	730	U	730	120	106.5	NA	2/25/12 18:34		281447	
Chlorobenzene	82	I	730	47	106.5	NA	2/25/12 18:34		281447	
Chloroethane	730	U	730	64	106.5	NA	2/25/12 18:34		281447	
Chloroform	730	U	730	78	106.5	NA	2/25/12 18:34		281447	
Chloromethane	730	U	730	65	106.5	NA	2/25/12 18:34		281447	
Dibromochloromethane	730	U	730	52	106.5	NA	2/25/12 18:34		281447	
Dichloromethane	730	U	730	33	106.5	NA	2/25/12 18:34		281447	
Ethylbenzene	730	U	730	62	106.5	NA	2/25/12 18:34		281447	
Styrene	730	U	730	46	106.5	NA	2/25/12 18:34		281447	
Tetrachloroethene (PCE)	730	U	730	84	106.5	NA	2/25/12 18:34		281447	
Toluene	730	U	730	46	106.5	NA	2/25/12 18:34		281447	
Trichloroethene (TCE)	160	I	730	75	106.5	NA	2/25/12 18:34		281447	
Vinyl Chloride	590	I	730	69	106.5	NA	2/25/12 18:34		281447	
cis-1,2-Dichloroethene	560	I	730	55	106.5	NA	2/25/12 18:34		281447	
cis-1,3-Dichloropropene	730	U	730	52	106.5	NA	2/25/12 18:34		281447	
m,p-Xylenes	1500	U	1500	110	106.5	NA	2/25/12 18:34		281447	
n-Butyl Acetate	730	U	730	67	106.5	NA	2/25/12 18:34		281447	
o-Xylene	730	U	730	46	106.5	NA	2/25/12 18:34		281447	
trans-1,2-Dichloroethene	730	U	730	56	106.5	NA	2/25/12 18:34		281447	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-045.5-20120213
Lab Code: R1201033-019

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	730	U	730	30	106.5	NA	2/25/12 18:34		281447	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	77-128	2/25/12 18:34	
Dibromofluoromethane	98	65-136	2/25/12 18:34	
Toluene-d8	97	75-126	2/25/12 18:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-047.0-20120213
Lab Code: R1201033-020

Service Request: R1201033
Date Collected: 2/13/12 1321
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	68.3	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1321
Date Received: 2/15/12
Date Analyzed: 2/25/12 19:04

Sample Name: LC34-DPT0348-047.0-20120213
Lab Code: R1201033-020

Units: µg/Kg
Basis: Dry
Percent Solids: 68.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6594.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 332.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2400	U	2400	180	
79-34-5	1,1,2,2-Tetrachloroethane	2400	U	2400	98	
79-00-5	1,1,2-Trichloroethane	2400	U	2400	120	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2400	U	2400	98	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2400	U	2400	98	
107-06-2	1,2-Dichloroethane	2400	U	2400	98	
78-87-5	1,2-Dichloropropane	2400	U	2400	130	
71-36-3	n-Butanol	120000	U	120000	7600	
78-93-3	2-Butanone (MEK)	2400	U	2400	330	
591-78-6	2-Hexanone	2400	U	2400	130	
108-10-1	4-Methyl-2-pentanone	2400	U	2400	120	
67-64-1	Acetone	2400	U	2400	550	
71-43-2	Benzene	2400	U	2400	98	
75-27-4	Bromodichloromethane	2400	U	2400	98	
75-25-2	Bromoform	2400	U	2400	120	
74-83-9	Bromomethane	2400	U	2400	200	
75-15-0	Carbon Disulfide	2400	U	2400	440	
56-23-5	Carbon Tetrachloride	2400	U	2400	130	
108-90-7	Chlorobenzene	920	I	2400	98	
75-00-3	Chloroethane	2400	U	2400	190	
67-66-3	Chloroform	2400	U	2400	98	
74-87-3	Chloromethane	2400	U	2400	230	
124-48-1	Dibromochloromethane	2400	U	2400	98	
75-09-2	Dichloromethane	2400	U	2400	140	
100-41-4	Ethylbenzene	2400	U	2400	98	
100-42-5	Styrene	2400	U	2400	98	
127-18-4	Tetrachloroethene (PCE)	2400	U	2400	98	
108-88-3	Toluene	2400	U	2400	98	
79-01-6	Trichloroethene (TCE)	41000		2400	98	
75-01-4	Vinyl Chloride	2400	U	2400	140	
156-59-2	cis-1,2-Dichloroethene	23000		2400	380	
10061-01-5	cis-1,3-Dichloropropene	2400	U	2400	98	
179601-23-1	m,p-Xylenes	4900	U	4900	330	
123-86-4	n-Butyl Acetate	2400	U	2400	98	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1321
Date Received: 2/15/12
Date Analyzed: 2/25/12 19:04

Sample Name: LC34-DPT0348-047.0-20120213
Lab Code: R1201033-020

Units: µg/Kg
Basis: Dry
Percent Solids: 68.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\022512\U6594.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 332.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	2400	U	2400	98	
156-60-5	trans-1,2-Dichloroethene	270	I	2400	120	
10061-02-6	trans-1,3-Dichloropropene	2400	U	2400	98	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/25/12 19:04	
Dibromofluoromethane	96	89-119	2/25/12 19:04	
Toluene-d8	97	87-121	2/25/12 19:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-048.5-20120213
Lab Code: R1201033-021

Service Request: R1201033
Date Collected: 2/13/12 1330
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	75.0	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-048.5-20120213
Lab Code: R1201033-021

Service Request: R1201033
Date Collected: 2/13/12 1330
Date Received: 2/15/12
Units: µg/Kg
Basis: Dry
Percent Solids: 75.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1700	U	1700	120	248.5	NA	2/25/12 19:35		281447	
1,1,2,2-Tetrachloroethane	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
1,1,2-Trichloroethane	1700	U	1700	77	248.5	NA	2/25/12 19:35		281447	
1,1-Dichloroethane (1,1-DCA)	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
1,1-Dichloroethene (1,1-DCE)	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
1,2-Dichloroethane	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
1,2-Dichloropropane	1700	U	1700	83	248.5	NA	2/25/12 19:35		281447	
n-Butanol	83000	U	83000	5200	248.5	NA	2/25/12 19:35		281447	
2-Butanone (MEK)	1700	U	1700	220	248.5	NA	2/25/12 19:35		281447	
2-Hexanone	1700	U	1700	83	248.5	NA	2/25/12 19:35		281447	
4-Methyl-2-pentanone	1700	U	1700	77	248.5	NA	2/25/12 19:35		281447	
Acetone	1700	U	1700	380	248.5	NA	2/25/12 19:35		281447	
Benzene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Bromodichloromethane	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Bromoform	1700	U	1700	80	248.5	NA	2/25/12 19:35		281447	
Bromomethane	1700	U	1700	140	248.5	NA	2/25/12 19:35		281447	
Carbon Disulfide	1700	U	1700	300	248.5	NA	2/25/12 19:35		281447	
Carbon Tetrachloride	1700	U	1700	87	248.5	NA	2/25/12 19:35		281447	
Chlorobenzene	380	I	1700	67	248.5	NA	2/25/12 19:35		281447	
Chloroethane	1700	U	1700	130	248.5	NA	2/25/12 19:35		281447	
Chloroform	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Chloromethane	1700	U	1700	160	248.5	NA	2/25/12 19:35		281447	
Dibromochloromethane	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Dichloromethane	1700	U	1700	90	248.5	NA	2/25/12 19:35		281447	
Ethylbenzene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Styrene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Tetrachloroethene (PCE)	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Toluene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
Trichloroethene (TCE)	75000		3300	140	497	NA	2/27/12 14:20		281525	
Vinyl Chloride	1700	U	1700	93	248.5	NA	2/25/12 19:35		281447	
cis-1,2-Dichloroethene	27000		1700	260	248.5	NA	2/25/12 19:35		281447	
cis-1,3-Dichloropropene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
m,p-Xylenes	3300	U	3300	230	248.5	NA	2/25/12 19:35		281447	
n-Butyl Acetate	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
o-Xylene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	
trans-1,2-Dichloroethene	240	I	1700	77	248.5	NA	2/25/12 19:35		281447	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-048.5-20120213
Lab Code: R1201033-021

Service Request: R1201033
Date Collected: 2/13/12 1330
Date Received: 2/15/12
Units: µg/Kg
Basis: Dry
Percent Solids: 75.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1700	U	1700	67	248.5	NA	2/25/12 19:35		281447	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/25/12 19:35	
Dibromofluoromethane	100	89-119	2/25/12 19:35	
Toluene-d8	98	87-121	2/25/12 19:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-053.0-20120213
Lab Code: R1201033-022

Service Request: R1201033
Date Collected: 2/13/12 1345
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	81.0	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1345
Date Received: 2/15/12
Date Analyzed: 2/24/12 22:08

Sample Name: LC34-DPT0348-053.0-20120213
Lab Code: R1201033-022

Units: µg/Kg
Basis: Dry
Percent Solids: 81.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022412\J6446.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: .87

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.4 U	5.4	0.33	
79-34-5	1,1,2,2-Tetrachloroethane	5.4 U	5.4	0.38	
79-00-5	1,1,2-Trichloroethane	5.4 U	5.4	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.4 U	5.4	0.29	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.4 U	5.4	0.40	
107-06-2	1,2-Dichloroethane	5.4 U	5.4	0.33	
78-87-5	1,2-Dichloropropane	5.4 U	5.4	0.39	
71-36-3	n-Butanol	270 U	270	13	
78-93-3	2-Butanone (MEK)	5.4 U	5.4	2.2	
591-78-6	2-Hexanone	5.4 U	5.4	1.3	
108-10-1	4-Methyl-2-pentanone	5.4 U	5.4	0.46	
67-64-1	Acetone	11 V	5.4	1.2	
71-43-2	Benzene	5.4 U	5.4	0.26	
75-27-4	Bromodichloromethane	5.4 U	5.4	0.31	
75-25-2	Bromoform	5.4 U	5.4	0.45	
74-83-9	Bromomethane	5.4 U	5.4	0.41	
75-15-0	Carbon Disulfide	22	5.4	0.31	
56-23-5	Carbon Tetrachloride	5.4 U	5.4	0.82	
108-90-7	Chlorobenzene	5.4 U	5.4	0.35	
75-00-3	Chloroethane	5.4 U	5.4	0.47	
67-66-3	Chloroform	5.4 U	5.4	0.57	
74-87-3	Chloromethane	5.4 U	5.4	0.48	
124-48-1	Dibromochloromethane	5.4 U	5.4	0.38	
75-09-2	Dichloromethane	5.4 U	5.4	0.24	
100-41-4	Ethylbenzene	5.4 U	5.4	0.46	
100-42-5	Styrene	5.4 U	5.4	0.34	
127-18-4	Tetrachloroethene (PCE)	5.4 U	5.4	0.62	
108-88-3	Toluene	0.35 I	5.4	0.34	
79-01-6	Trichloroethene (TCE)	1.0 I	5.4	0.55	
75-01-4	Vinyl Chloride	3.2 I	5.4	0.51	
156-59-2	cis-1,2-Dichloroethene	3.9 I	5.4	0.40	
10061-01-5	cis-1,3-Dichloropropene	5.4 U	5.4	0.38	
179601-23-1	m,p-Xylenes	11 U	11	0.75	
123-86-4	n-Butyl Acetate	0.71 I	5.4	0.49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1345
Date Received: 2/15/12
Date Analyzed: 2/24/12 22:08

Sample Name: LC34-DPT0348-053.0-20120213
Lab Code: R1201033-022

Units: µg/Kg
Basis: Dry
Percent Solids: 81.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQDATA\MSVOA7\DATA\022412\J6446.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: .87

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	5.4 U	5.4	0.34	
156-60-5	trans-1,2-Dichloroethene	5.4 U	5.4	0.41	
10061-02-6	trans-1,3-Dichloropropene	5.4 U	5.4	0.22	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	77-128	2/24/12 22:08	
Dibromofluoromethane	95	65-136	2/24/12 22:08	
Toluene-d8	103	75-126	2/24/12 22:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Collected: 2/13/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 11:55

Sample Name: LC34-TB-20120213
Lab Code: R1201033-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8368.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Collected: 2/13/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 11:55

Sample Name: LC34-TB-20120213
Lab Code: R1201033-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8368.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	2/17/12 11:55	
Dibromofluoromethane	103	89-119	2/17/12 11:55	
Toluene-d8	98	87-121	2/17/12 11:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-045.4-20120213
Lab Code: R1201033-024

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6		Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Date Analyzed: 2/27/12 22:52

Sample Name: LC34-DPT0348-045.4-20120213
Lab Code: R1201033-024

Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6493.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: 1.18

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	8.1 U	8.1	0.49	
79-34-5	1,1,2,2-Tetrachloroethane	8.1 U	8.1	0.57	
79-00-5	1,1,2-Trichloroethane	8.1 U	8.1	0.46	
75-34-3	1,1-Dichloroethane (1,1-DCA)	8.1 U	8.1	0.44	
75-35-4	1,1-Dichloroethene (1,1-DCE)	8.1 U	8.1	0.61	
107-06-2	1,2-Dichloroethane	8.1 U	8.1	0.49	
78-87-5	1,2-Dichloropropane	8.1 U	8.1	0.59	
71-36-3	n-Butanol	26 I	410	19	
78-93-3	2-Butanone (MEK)	10	8.1	3.3	
591-78-6	2-Hexanone	8.1 U	8.1	1.9	
108-10-1	4-Methyl-2-pentanone	8.1 U	8.1	0.69	
67-64-1	Acetone	91	8.1	1.8	
71-43-2	Benzene	8.1 U	8.1	0.40	
75-27-4	Bromodichloromethane	8.1 U	8.1	0.46	
75-25-2	Bromoform	8.1 U	8.1	0.67	
74-83-9	Bromomethane	8.1 U	8.1	0.62	
75-15-0	Carbon Disulfide	13	8.1	0.46	
56-23-5	Carbon Tetrachloride	8.1 U	8.1	1.3	
108-90-7	Chlorobenzene	2.3 I	8.1	0.53	
75-00-3	Chloroethane	8.1 U	8.1	0.70	
67-66-3	Chloroform	8.1 U	8.1	0.87	
74-87-3	Chloromethane	8.1 U	8.1	0.72	
124-48-1	Dibromochloromethane	8.1 U	8.1	0.57	
75-09-2	Dichloromethane	8.1 U	8.1	0.36	
100-41-4	Ethylbenzene	8.1 U	8.1	0.69	
100-42-5	Styrene	8.1 U	8.1	0.51	
127-18-4	Tetrachloroethene (PCE)	8.1 U	8.1	0.93	
108-88-3	Toluene	8.1 U	8.1	0.51	
79-01-6	Trichloroethene (TCE)	190	8.1	0.83	
75-01-4	Vinyl Chloride	0.91 I	8.1	0.77	
156-59-2	cis-1,2-Dichloroethene	31	8.1	0.61	
10061-01-5	cis-1,3-Dichloropropene	8.1 U	8.1	0.57	
179601-23-1	m,p-Xylenes	16 U	16	1.2	
123-86-4	n-Butyl Acetate	2.5 I	8.1	0.74	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Date Analyzed: 2/27/12 22:52

Sample Name: LC34-DPT0348-045.4-20120213
Lab Code: R1201033-024

Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6493.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: 1.18

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
95-47-6	o-Xylene	3.2 I	8.1	0.51	
156-60-5	trans-1,2-Dichloroethene	8.1 U	8.1	0.62	
10061-02-6	trans-1,3-Dichloropropene	8.1 U	8.1	0.33	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	77-128	2/27/12 22:52	
Dibromofluoromethane	99	65-136	2/27/12 22:52	
Toluene-d8	105	75-126	2/27/12 22:52	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: LC34-DPT0348-045.6-20120213
Lab Code: R1201033-025

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Date Analyzed: 2/25/12 18:07

Sample Name: LC34-DPT0348-045.6-20120213
Lab Code: R1201033-025

Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6461.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .83

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.7 U	5.7	0.35	
79-34-5	1,1,2,2-Tetrachloroethane	5.7 U	5.7	0.41	
79-00-5	1,1,2-Trichloroethane	5.7 U	5.7	0.33	
75-34-3	1,1-Dichloroethane (1,1-DCA)	0.42 I	5.7	0.31	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.7 U	5.7	0.43	
107-06-2	1,2-Dichloroethane	5.7 U	5.7	0.35	
78-87-5	1,2-Dichloropropane	5.7 U	5.7	0.42	
71-36-3	n-Butanol	290 U	290	14	
78-93-3	2-Butanone (MEK)	5.7 U	5.7	2.3	
591-78-6	2-Hexanone	5.7 U	5.7	1.4	
108-10-1	4-Methyl-2-pentanone	5.7 U	5.7	0.49	
67-64-1	Acetone	37	5.7	1.3	
71-43-2	Benzene	5.7 U	5.7	0.28	
75-27-4	Bromodichloromethane	5.7 U	5.7	0.33	
75-25-2	Bromoform	5.7 U	5.7	0.47	
74-83-9	Bromomethane	5.7 U	5.7	0.44	
75-15-0	Carbon Disulfide	67	5.7	0.33	
56-23-5	Carbon Tetrachloride	5.7 U	5.7	0.87	
108-90-7	Chlorobenzene	5.7 U	5.7	0.37	
75-00-3	Chloroethane	5.7 U	5.7	0.50	
67-66-3	Chloroform	5.7 U	5.7	0.61	
74-87-3	Chloromethane	5.7 U	5.7	0.51	
124-48-1	Dibromochloromethane	5.7 U	5.7	0.41	
75-09-2	Dichloromethane	0.30 I	5.7	0.26	
100-41-4	Ethylbenzene	5.7 U	5.7	0.49	
100-42-5	Styrene	5.7 U	5.7	0.36	
127-18-4	Tetrachloroethene (PCE)	5.7 U	5.7	0.66	
108-88-3	Toluene	0.59 I	5.7	0.36	
79-01-6	Trichloroethene (TCE)	3400 L	5.7	0.59	
75-01-4	Vinyl Chloride	390 L	5.7	0.54	
156-59-2	cis-1,2-Dichloroethene	1300 L	5.7	0.43	
10061-01-5	cis-1,3-Dichloropropene	5.7 U	5.7	0.41	
179601-23-1	m,p-Xylenes	11 U	11	0.79	
123-86-4	n-Butyl Acetate	1.1 I	5.7	0.52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: 2/13/12 1312
Date Received: 2/15/12
Date Analyzed: 2/25/12 18:07

Sample Name: LC34-DPT0348-045.6-20120213
Lab Code: R1201033-025

Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\022512\J6461.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: .83

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	5.7	U	5.7	0.36	
156-60-5	trans-1,2-Dichloroethene	14		5.7	0.44	
10061-02-6	trans-1,3-Dichloropropene	5.7	U	5.7	0.23	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	77-128	2/25/12 18:07	
Dibromofluoromethane	97	65-136	2/25/12 18:07	
Toluene-d8	104	75-126	2/25/12 18:07	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1201033-MB1

Service Request: R1201033
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1201033-MB2

Service Request: R1201033
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	2/16/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/17/12 11:25

Sample Name: Method Blank
Lab Code: RQ1201955-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8367.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/17/12 11:25

Sample Name: Method Blank
Lab Code: RQ1201955-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8367.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	2/17/12 11:25	
Dibromofluoromethane	102	89-119	2/17/12 11:25	
Toluene-d8	98	87-121	2/17/12 11:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/23/12 16:25

Sample Name: Method Blank
Lab Code: RQ1202043-01

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8489.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	13	
71-36-3	n-Butanol	13000 U	13000	780	
78-93-3	2-Butanone (MEK)	47 I	250	33	
591-78-6	2-Hexanone	250 U	250	13	
108-10-1	4-Methyl-2-pentanone	250 U	250	12	
67-64-1	Acetone	250 U	250	57	
71-43-2	Benzene	250 U	250	10	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	12	
74-83-9	Bromomethane	250 U	250	21	
75-15-0	Carbon Disulfide	250 U	250	45	
56-23-5	Carbon Tetrachloride	250 U	250	13	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	19	
67-66-3	Chloroform	250 U	250	10	
74-87-3	Chloromethane	250 U	250	23	
124-48-1	Dibromochloromethane	250 U	250	10	
75-09-2	Dichloromethane	250 U	250	14	
100-41-4	Ethylbenzene	250 U	250	10	
100-42-5	Styrene	250 U	250	10	
127-18-4	Tetrachloroethene (PCE)	250 U	250	10	
108-88-3	Toluene	250 U	250	10	
79-01-6	Trichloroethene (TCE)	250 U	250	10	
75-01-4	Vinyl Chloride	250 U	250	15	
156-59-2	cis-1,2-Dichloroethene	250 U	250	39	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	10	
179601-23-1	m,p-Xylenes	500 U	500	34	
123-86-4	n-Butyl Acetate	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/23/12 16:25

Sample Name: Method Blank
Lab Code: RQ1202043-01

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022312\D8489.D\

Analysis Lot: 281215
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	250	U	250	12	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	2/23/12 16:25	
Dibromofluoromethane	104	89-119	2/23/12 16:25	
Toluene-d8	106	87-121	2/23/12 16:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/24/12 14:03

Sample Name: Method Blank
Lab Code: RQ1202069-01

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\022412\D8517.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	13	
71-36-3	n-Butanol	13000 U	13000	780	
78-93-3	2-Butanone (MEK)	51 I	250	33	
591-78-6	2-Hexanone	250 U	250	13	
108-10-1	4-Methyl-2-pentanone	250 U	250	12	
67-64-1	Acetone	250 U	250	57	
71-43-2	Benzene	250 U	250	10	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	12	
74-83-9	Bromomethane	250 U	250	21	
75-15-0	Carbon Disulfide	250 U	250	45	
56-23-5	Carbon Tetrachloride	250 U	250	13	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	19	
67-66-3	Chloroform	250 U	250	10	
74-87-3	Chloromethane	250 U	250	23	
124-48-1	Dibromochloromethane	250 U	250	10	
75-09-2	Dichloromethane	250 U	250	14	
100-41-4	Ethylbenzene	250 U	250	10	
100-42-5	Styrene	250 U	250	10	
127-18-4	Tetrachloroethene (PCE)	250 U	250	10	
108-88-3	Toluene	250 U	250	10	
79-01-6	Trichloroethene (TCE)	250 U	250	10	
75-01-4	Vinyl Chloride	250 U	250	15	
156-59-2	cis-1,2-Dichloroethene	250 U	250	39	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	10	
179601-23-1	m,p-Xylenes	500 U	500	34	
123-86-4	n-Butyl Acetate	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/24/12 14:03

Sample Name: Method Blank
Lab Code: RQ1202069-01

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\msvoa10\data\022412\D8517.D\

Analysis Lot: 281373
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	250	U	250	12	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	2/24/12 14:03	
Dibromofluoromethane	104	89-119	2/24/12 14:03	
Toluene-d8	107	87-121	2/24/12 14:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/24/12 20:19

Sample Name: Method Blank
Lab Code: RQ1202004-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022412\J6443.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.35	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.28	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.27	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.36	
71-36-3	n-Butanol	250 U	250	12	
78-93-3	2-Butanone (MEK)	5.0 U	5.0	2.0	
591-78-6	2-Hexanone	5.0 U	5.0	1.2	
108-10-1	4-Methyl-2-pentanone	5.0 U	5.0	0.42	
67-64-1	Acetone	1.3 I	5.0	1.1	
71-43-2	Benzene	5.0 U	5.0	0.24	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.28	
75-25-2	Bromoform	5.0 U	5.0	0.41	
74-83-9	Bromomethane	5.0 U	5.0	0.38	
75-15-0	Carbon Disulfide	5.0 U	5.0	0.28	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.76	
108-90-7	Chlorobenzene	5.0 U	5.0	0.32	
75-00-3	Chloroethane	5.0 U	5.0	0.43	
67-66-3	Chloroform	5.0 U	5.0	0.53	
74-87-3	Chloromethane	5.0 U	5.0	0.44	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.35	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	
100-42-5	Styrene	5.0 U	5.0	0.31	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.57	
108-88-3	Toluene	5.0 U	5.0	0.31	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.51	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.47	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.37	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.35	
179601-23-1	m,p-Xylenes	10 U	10	0.69	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/24/12 20:19

Sample Name: Method Blank
Lab Code: RQ1202004-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\022412\J6443.D\

Analysis Lot: 281378
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	5.0	U	5.0	0.31	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.38	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	77-128	2/24/12 20:19	
Dibromofluoromethane	88	65-136	2/24/12 20:19	
Toluene-d8	104	75-126	2/24/12 20:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/25/12 15:44

Sample Name: Method Blank
Lab Code: RQ1202011-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022512\J6457.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.35	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.28	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.27	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.36	
71-36-3	n-Butanol	250 U	250	12	
78-93-3	2-Butanone (MEK)	5.0 U	5.0	2.0	
591-78-6	2-Hexanone	5.0 U	5.0	1.2	
108-10-1	4-Methyl-2-pentanone	5.0 U	5.0	0.42	
67-64-1	Acetone	5.0 U	5.0	1.1	
71-43-2	Benzene	5.0 U	5.0	0.24	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.28	
75-25-2	Bromoform	5.0 U	5.0	0.41	
74-83-9	Bromomethane	5.0 U	5.0	0.38	
75-15-0	Carbon Disulfide	5.0 U	5.0	0.28	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.76	
108-90-7	Chlorobenzene	5.0 U	5.0	0.32	
75-00-3	Chloroethane	5.0 U	5.0	0.43	
67-66-3	Chloroform	5.0 U	5.0	0.53	
74-87-3	Chloromethane	5.0 U	5.0	0.44	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.35	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	
100-42-5	Styrene	5.0 U	5.0	0.31	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.57	
108-88-3	Toluene	5.0 U	5.0	0.31	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.51	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.47	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.37	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.35	
179601-23-1	m,p-Xylenes	10 U	10	0.69	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/25/12 15:44

Sample Name: Method Blank
Lab Code: RQ1202011-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA7\DATA\022512\J6457.D\

Analysis Lot: 281419
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	5.0	U	5.0	0.31	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.38	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	77-128	2/25/12 15:44	
Dibromofluoromethane	101	65-136	2/25/12 15:44	
Toluene-d8	106	75-126	2/25/12 15:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/25/12 17:03

Sample Name: Method Blank
Lab Code: RQ1202101-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6590.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	13	
71-36-3	n-Butanol	13000	U	13000	780	
78-93-3	2-Butanone (MEK)	84	I	250	33	
591-78-6	2-Hexanone	250	U	250	13	
108-10-1	4-Methyl-2-pentanone	250	U	250	12	
67-64-1	Acetone	250	U	250	57	
71-43-2	Benzene	250	U	250	10	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	12	
74-83-9	Bromomethane	250	U	250	21	
75-15-0	Carbon Disulfide	250	U	250	45	
56-23-5	Carbon Tetrachloride	250	U	250	13	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	19	
67-66-3	Chloroform	250	U	250	10	
74-87-3	Chloromethane	250	U	250	23	
124-48-1	Dibromochloromethane	250	U	250	10	
75-09-2	Dichloromethane	250	U	250	14	
100-41-4	Ethylbenzene	250	U	250	10	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	250	U	250	10	
75-01-4	Vinyl Chloride	250	U	250	15	
156-59-2	cis-1,2-Dichloroethene	250	U	250	39	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	500	U	500	34	
123-86-4	n-Butyl Acetate	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/25/12 17:03

Sample Name: Method Blank
Lab Code: RQ1202101-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022512\U6590.D\

Analysis Lot: 281447
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	22	I	250	10	
156-60-5	trans-1,2-Dichloroethene	250	U	250	12	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	2/25/12 17:03	
Dibromofluoromethane	97	89-119	2/25/12 17:03	
Toluene-d8	96	87-121	2/25/12 17:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/27/12 12:48

Sample Name: Method Blank
Lab Code: RQ1202040-08

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\022712\U6605.D\

Analysis Lot: 281525
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	13	
71-36-3	n-Butanol	13000	U	13000	780	
78-93-3	2-Butanone (MEK)	250	U	250	33	
591-78-6	2-Hexanone	250	U	250	13	
108-10-1	4-Methyl-2-pentanone	250	U	250	12	
67-64-1	Acetone	250	U	250	57	
71-43-2	Benzene	250	U	250	10	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	12	
74-83-9	Bromomethane	26	I	250	21	
75-15-0	Carbon Disulfide	250	U	250	45	
56-23-5	Carbon Tetrachloride	250	U	250	13	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	19	
67-66-3	Chloroform	250	U	250	10	
74-87-3	Chloromethane	250	U	250	23	
124-48-1	Dibromochloromethane	250	U	250	10	
75-09-2	Dichloromethane	250	U	250	14	
100-41-4	Ethylbenzene	250	U	250	10	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	250	U	250	10	
75-01-4	Vinyl Chloride	250	U	250	15	
156-59-2	cis-1,2-Dichloroethene	250	U	250	39	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	500	U	500	34	
123-86-4	n-Butyl Acetate	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/27/12 12:48

Sample Name: Method Blank
Lab Code: RQ1202040-08

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\022712\U6605.D\

Analysis Lot: 281525
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	250	U	250	12	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	2/27/12 12:48	
Dibromofluoromethane	96	89-119	2/27/12 12:48	
Toluene-d8	98	87-121	2/27/12 12:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/27/12 21:29

Sample Name: Method Blank
Lab Code: RQ1202055-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6491.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.30	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.35	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.28	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.27	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.37	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.30	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.36	
71-36-3	n-Butanol	250 U	250	12	
78-93-3	2-Butanone (MEK)	5.0 U	5.0	2.0	
591-78-6	2-Hexanone	5.0 U	5.0	1.2	
108-10-1	4-Methyl-2-pentanone	5.0 U	5.0	0.42	
67-64-1	Acetone	5.0 U	5.0	1.1	
71-43-2	Benzene	5.0 U	5.0	0.24	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.28	
75-25-2	Bromoform	5.0 U	5.0	0.41	
74-83-9	Bromomethane	5.0 U	5.0	0.38	
75-15-0	Carbon Disulfide	5.0 U	5.0	0.28	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.76	
108-90-7	Chlorobenzene	5.0 U	5.0	0.32	
75-00-3	Chloroethane	5.0 U	5.0	0.43	
67-66-3	Chloroform	5.0 U	5.0	0.53	
74-87-3	Chloromethane	5.0 U	5.0	0.44	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.35	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.42	
100-42-5	Styrene	5.0 U	5.0	0.31	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.57	
108-88-3	Toluene	5.0 U	5.0	0.31	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.51	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.47	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.37	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.35	
179601-23-1	m,p-Xylenes	10 U	10	0.69	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Collected: NA
Date Received: NA
Date Analyzed: 2/27/12 21:29

Sample Name: Method Blank
Lab Code: RQ1202055-05

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\022712\J6491.D\

Analysis Lot: 281576
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
95-47-6	o-Xylene	5.0	U	5.0	0.31	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.38	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	77-128	2/27/12 21:29	
Dibromofluoromethane	95	65-136	2/27/12 21:29	
Toluene-d8	106	75-126	2/27/12 21:29	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Analyzed: 2/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280472

Lab Control Sample
RQ1201955-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.6	20.0	83	72 - 128
1,1,2,2-Tetrachloroethane	19.2	20.0	96	72 - 131
1,1,2-Trichloroethane	18.2	20.0	91	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.6	20.0	78	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.9	20.0	90	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.9	20.0	90	72 - 129
1,2,4-Trichlorobenzene	18.7	20.0	94	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.2	20.0	96	62 - 131
1,2-Dibromoethane	20.4	20.0	102	78 - 125
1,2-Dichlorobenzene	18.9	20.0	94	79 - 124
1,2-Dichloroethane	18.9	20.0	95	73 - 127
1,2-Dichloropropane	17.9	20.0	90	80 - 123
1,3-Dichlorobenzene	18.6	20.0	93	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	900	1000	90	70 - 130
2-Butanone (MEK)	17.7	20.0	89	60 - 133
2-Hexanone	18.9	20.0	94	61 - 131
4-Methyl-2-pentanone	18.0	20.0	90	61 - 132
Acetone	18.2	20.0	91	54 - 139
Benzene	17.2	20.0	86	78 - 121
Bromodichloromethane	18.1	20.0	91	80 - 125
Bromoform	18.6	20.0	93	68 - 130
Bromomethane	17.2	20.0	86	57 - 144
Carbon Disulfide	17.6	20.0	88	52 - 140
Carbon Tetrachloride	16.7	20.0	84	68 - 133
Chlorobenzene	18.2	20.0	91	80 - 121
Chloroethane	16.9	20.0	85	71 - 130
Chloroform	17.6	20.0	88	78 - 125
Chloromethane	19.6	20.0	98	61 - 138
Cyclohexane	16.9	20.0	84	57 - 126
Dibromochloromethane	20.2	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	16.7	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Water

Service Request: R1201033
Date Analyzed: 2/17/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280472

**Lab Control Sample
 RQ1201955-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.1	20.0	90	75 - 125
Ethylbenzene	17.7	20.0	89	78 - 123
Isopropylbenzene (Cumene)	17.8	20.0	89	73 - 133
Methyl Acetate	19.3	20.0	97	57 - 157
Methyl tert-Butyl Ether	17.7	20.0	88	75 - 126
Methylcyclohexane	17.4	20.0	87	61 - 125
Styrene	18.1	20.0	91	80 - 132
Tetrachloroethene (PCE)	17.9	20.0	89	72 - 131
Toluene	17.0	20.0	85	78 - 122
Trichloroethene (TCE)	16.6	20.0	83	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	69 - 141
Vinyl Chloride	16.9	20.0	84	72 - 138
cis-1,2-Dichloroethene	17.8	20.0	89	78 - 122
cis-1,3-Dichloropropene	16.9	20.0	85	77 - 125
m,p-Xylenes	36.4	40.0	91	79 - 126
n-Butyl Acetate	19.9	20.0	99	31 - 144
o-Xylene	18.2	20.0	91	77 - 118
trans-1,2-Dichloroethene	17.1	20.0	86	75 - 121
trans-1,3-Dichloropropene	17.5	20.0	87	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/23/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 281215

**Lab Control Sample
 RQ1202043-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.0	20.0	100	72 - 128
1,1,2,2-Tetrachloroethane	20.9	20.0	105	72 - 131
1,1,2-Trichloroethane	20.9	20.0	104	80 - 122
1,1-Dichloroethane (1,1-DCA)	21.8	20.0	109	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.3	20.0	106	72 - 129
1,2-Dichloroethane	22.3	20.0	112	73 - 127
1,2-Dichloropropane	22.2	20.0	111	80 - 123
n-Butanol	977	1000	97	70 - 130
2-Butanone (MEK)	19.6	20.0	98	60 - 133
2-Hexanone	20.4	20.0	102	61 - 131
4-Methyl-2-pentanone	19.6	20.0	98	61 - 132
Acetone	17.3	20.0	86	54 - 139
Benzene	21.2	20.0	106	78 - 121
Bromodichloromethane	21.2	20.0	106	80 - 125
Bromoform	20.8	20.0	104	68 - 130
Bromomethane	18.4	20.0	92	57 - 144
Carbon Disulfide	20.7	20.0	104	52 - 140
Carbon Tetrachloride	21.4	20.0	107	68 - 133
Chlorobenzene	21.1	20.0	106	80 - 121
Chloroethane	20.8	20.0	104	71 - 130
Chloroform	20.8	20.0	104	78 - 125
Chloromethane	22.5	20.0	112	61 - 138
Dibromochloromethane	21.9	20.0	109	78 - 133
Dichloromethane	20.3	20.0	102	75 - 125
Ethylbenzene	20.9	20.0	104	78 - 123
Styrene	20.6	20.0	103	80 - 132
Tetrachloroethene (PCE)	21.7	20.0	109	72 - 131
Toluene	21.0	20.0	105	78 - 122
Trichloroethene (TCE)	19.8	20.0	99	74 - 127
Vinyl Chloride	22.2	20.0	111	72 - 138
cis-1,2-Dichloroethene	20.3	20.0	101	78 - 122
cis-1,3-Dichloropropene	20.3	20.0	101	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/23/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281215

Lab Control Sample
RQ1202043-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	43.2	40.0	108	79 - 126
n-Butyl Acetate	20.0	20.0	100	31 - 144
o-Xylene	21.1	20.0	105	77 - 118
trans-1,2-Dichloroethene	20.0	20.0	100	75 - 121
trans-1,3-Dichloropropene	20.6	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/24/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281373

**Lab Control Sample
 RQ1202069-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.5	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	22.2	20.0	111	72 - 131
1,1,2-Trichloroethane	20.6	20.0	103	80 - 122
1,1-Dichloroethane (1,1-DCA)	21.0	20.0	105	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.5	20.0	102	72 - 129
1,2-Dichloroethane	22.5	20.0	112	73 - 127
1,2-Dichloropropane	21.2	20.0	106	80 - 123
n-Butanol	933	1000	93	70 - 130
2-Butanone (MEK)	20.7	20.0	104	60 - 133
2-Hexanone	22.1	20.0	111	61 - 131
4-Methyl-2-pentanone	21.2	20.0	106	61 - 132
Acetone	19.2	20.0	96	54 - 139
Benzene	20.1	20.0	100	78 - 121
Bromodichloromethane	21.0	20.0	105	80 - 125
Bromoform	21.7	20.0	109	68 - 130
Bromomethane	15.6	20.0	78	57 - 144
Carbon Disulfide	21.1	20.0	106	52 - 140
Carbon Tetrachloride	20.1	20.0	101	68 - 133
Chlorobenzene	20.5	20.0	103	80 - 121
Chloroethane	20.2	20.0	101	71 - 130
Chloroform	20.2	20.0	101	78 - 125
Chloromethane	22.3	20.0	112	61 - 138
Dibromochloromethane	22.2	20.0	111	78 - 133
Dichloromethane	20.9	20.0	105	75 - 125
Ethylbenzene	19.7	20.0	99	78 - 123
Styrene	19.5	20.0	97	80 - 132
Tetrachloroethene (PCE)	20.4	20.0	102	72 - 131
Toluene	20.1	20.0	101	78 - 122
Trichloroethene (TCE)	18.9	20.0	94	74 - 127
Vinyl Chloride	21.1	20.0	106	72 - 138
cis-1,2-Dichloroethene	19.9	20.0	99	78 - 122
cis-1,3-Dichloropropene	19.9	20.0	100	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/24/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry
Analysis Lot: 281373

Lab Control Sample
RQ1202069-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	41.1	40.0	103	79 - 126
n-Butyl Acetate	21.6	20.0	108	31 - 144
o-Xylene	20.5	20.0	102	77 - 118
trans-1,2-Dichloroethene	19.6	20.0	98	75 - 121
trans-1,3-Dichloropropene	20.3	20.0	102	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/24/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 281378

Analyte Name	Lab Control Sample RQ1202004-03			Duplicate Lab Control Sample RQ1202004-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	17.4	20.0	87	16.6	20.0	83	68 - 129	5	30
1,1,2,2-Tetrachloroethane	20.1	20.0	100	19.1	20.0	95	72 - 133	5	30
1,1,2-Trichloroethane	19.5	20.0	98	20.2	20.0	101	75 - 123	4	30
1,1-Dichloroethane (1,1-DCA)	17.5	20.0	87	17.5	20.0	88	71 - 129	<1	30
1,1-Dichloroethene (1,1-DCE)	19.2	20.0	96	19.3	20.0	97	71 - 133	<1	30
1,2-Dichloroethane	18.5	20.0	93	17.7	20.0	88	69 - 129	5	30
1,2-Dichloropropane	20.2	20.0	101	20.5	20.0	103	76 - 123	1	30
n-Butanol	977	1000	97	879	1000	88	70 - 130	11	30
2-Butanone (MEK)	15.7	20.0	78	15.9	20.0	80	69 - 129	1	30
2-Hexanone	24.1	20.0	120	20.2	20.0	101	62 - 130	18	30
4-Methyl-2-pentanone	21.9	20.0	110	20.2	20.0	101	64 - 136	8	30
Acetone	15.2	20.0	76	16.2	20.0	81	53 - 148	6	30
Benzene	21.8	20.0	109	21.2	20.0	106	74 - 120	3	30
Bromodichloromethane	19.2	20.0	96	19.2	20.0	96	74 - 123	<1	30
Bromoform	20.0	20.0	100	21.8	20.0	109	67 - 129	9	30
Bromomethane	14.5	20.0	72	15.5	20.0	77	53 - 143	7	30
Carbon Disulfide	20.3	20.0	101	20.1	20.0	100	58 - 139	1	30
Carbon Tetrachloride	20.7	20.0	103	18.6	20.0	93	62 - 136	10	30
Chlorobenzene	22.8	20.0	114	22.7	20.0	113	72 - 126	<1	30
Chloroethane	20.0	20.0	100	19.0	20.0	95	69 - 136	5	30
Chloroform	17.3	20.0	86	17.0	20.0	85	72 - 128	1	30
Chloromethane	24.2	20.0	121	23.0	20.0	115	60 - 140	5	30
Dibromochloromethane	19.8	20.0	99	19.5	20.0	97	70 - 133	2	30
Dichloromethane	18.6	20.0	93	18.3	20.0	91	75 - 122	2	30
Ethylbenzene	22.7	20.0	113	21.5	20.0	108	68 - 129	5	30
Styrene	22.6	20.0	113	22.1	20.0	111	68 - 125	2	30
Tetrachloroethene (PCE)	26.7	20.0	134 *	24.9	20.0	124	64 - 133	7	30
Toluene	23.2	20.0	116	23.3	20.0	117	70 - 126	<1	30
Trichloroethene (TCE)	21.7	20.0	108	21.3	20.0	106	71 - 125	2	30
Vinyl Chloride	20.2	20.0	101	19.5	20.0	97	65 - 143	4	30
cis-1,2-Dichloroethene	19.0	20.0	95	19.1	20.0	96	74 - 125	<1	30
cis-1,3-Dichloropropene	21.3	20.0	107	19.6	20.0	98	71 - 118	9	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/24/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281378

Analyte Name	Lab Control Sample RQ1202004-03			Duplicate Lab Control Sample RQ1202004-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
m,p-Xylenes	49.2	40.0	123	46.2	40.0	115	68 - 129	6	30
n-Butyl Acetate	21.3	20.0	106	18.9	20.0	95	52 - 143	12	30
o-Xylene	23.1	20.0	115	22.3	20.0	111	69 - 127	4	30
trans-1,2-Dichloroethene	19.5	20.0	97	19.4	20.0	97	71 - 127	<1	30
trans-1,3-Dichloropropene	19.5	20.0	98	18.9	20.0	94	70 - 120	3	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/25/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281419

Analyte Name	Lab Control Sample RQ1202011-03			Duplicate Lab Control Sample RQ1202011-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	16.7	20.0	84	16.1	20.0	80	68 - 129	4	30
1,1,2,2-Tetrachloroethane	17.8	20.0	89	16.7	20.0	84	72 - 133	6	30
1,1,2-Trichloroethane	19.9	20.0	100	17.4	20.0	87	75 - 123	13	30
1,1-Dichloroethane (1,1-DCA)	17.6	20.0	88	16.1	20.0	81	71 - 129	9	30
1,1-Dichloroethene (1,1-DCE)	18.6	20.0	93	18.0	20.0	90	71 - 133	4	30
1,2-Dichloroethane	16.6	20.0	83	16.9	20.0	84	69 - 129	2	30
1,2-Dichloropropane	18.8	20.0	94	19.1	20.0	96	76 - 123	2	30
n-Butanol	908	1000	90	881	1000	88	70 - 130	3	30
2-Butanone (MEK)	15.1	20.0	75	15.2	20.0	76	69 - 129	1	30
2-Hexanone	20.7	20.0	104	18.8	20.0	94	62 - 130	10	30
4-Methyl-2-pentanone	20.5	20.0	103	17.9	20.0	90	64 - 136	13	30
Acetone	15.3	20.0	77	15.4	20.0	77	53 - 148	<1	30
Benzene	20.9	20.0	104	19.4	20.0	97	74 - 120	7	30
Bromodichloromethane	17.4	20.0	87	18.2	20.0	91	74 - 123	5	30
Bromoform	19.6	20.0	98	18.1	20.0	91	67 - 129	8	30
Bromomethane	13.6	20.0	68	15.8	20.0	79	53 - 143	15	30
Carbon Disulfide	19.4	20.0	97	18.6	20.0	93	58 - 139	4	30
Carbon Tetrachloride	18.5	20.0	92	17.6	20.0	88	62 - 136	5	30
Chlorobenzene	20.4	20.0	102	20.2	20.0	101	72 - 126	1	30
Chloroethane	19.3	20.0	96	18.8	20.0	94	69 - 136	3	30
Chloroform	17.1	20.0	86	15.4	20.0	77	72 - 128	10	30
Chloromethane	23.8	20.0	119	22.8	20.0	114	60 - 140	4	30
Dibromochloromethane	18.4	20.0	92	16.7	20.0	84	70 - 133	9	30
Dichloromethane	17.3	20.0	86	16.4	20.0	82	75 - 122	5	30
Ethylbenzene	20.4	20.0	102	19.5	20.0	97	68 - 129	5	30
Styrene	20.2	20.0	101	20.0	20.0	100	68 - 125	<1	30
Tetrachloroethene (PCE)	23.4	20.0	117	21.9	20.0	110	64 - 133	7	30
Toluene	21.8	20.0	109	20.0	20.0	100	70 - 126	9	30
Trichloroethene (TCE)	19.6	20.0	98	18.5	20.0	93	71 - 125	6	30
Vinyl Chloride	19.5	20.0	98	19.2	20.0	96	65 - 143	1	30
cis-1,2-Dichloroethene	18.6	20.0	93	18.0	20.0	90	74 - 125	3	30
cis-1,3-Dichloropropene	18.2	20.0	91	18.8	20.0	94	71 - 118	3	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/25/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281419

Analyte Name	Lab Control Sample RQ1202011-03			Duplicate Lab Control Sample RQ1202011-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
m,p-Xylenes	44.6	40.0	112	41.5	40.0	104	68 - 129	7	30
n-Butyl Acetate	18.0	20.0	90	16.3	20.0	82	52 - 143	10	30
o-Xylene	20.5	20.0	102	20.6	20.0	103	69 - 127	<1	30
trans-1,2-Dichloroethene	19.3	20.0	97	17.9	20.0	90	71 - 127	8	30
trans-1,3-Dichloropropene	18.1	20.0	90	17.7	20.0	88	70 - 120	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/25/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281447

Analyte Name	Lab Control Sample RQ1202101-03			Duplicate Lab Control Sample RQ1202101-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	17.1	20.0	85	22.1	20.0	110	72 - 128	26	30
1,1,2,2-Tetrachloroethane	17.8	20.0	89	23.4	20.0	117	72 - 131	27	30
1,1,2-Trichloroethane	16.8	20.0	84	21.4	20.0	107	80 - 122	24	30
1,1-Dichloroethane (1,1-DCA)	17.7	20.0	89	23.5	20.0	118	76 - 124	28	30
1,1-Dichloroethene (1,1-DCE)	17.6	20.0	88	22.8	20.0	114	72 - 129	26	30
1,2-Dichloroethane	17.1	20.0	85	22.5	20.0	113	73 - 127	28	30
1,2-Dichloropropane	15.8	20.0	79 *	21.1	20.0	105	80 - 123	28	30
n-Butanol	909	1000	91	1260	1000	125	70 - 130	32 *	30
2-Butanone (MEK)	16.5	20.0	83	21.9	20.0	110	60 - 133	28	30
2-Hexanone	15.4	20.0	77	22.3	20.0	111	61 - 131	37 *	30
4-Methyl-2-pentanone	14.8	20.0	74	20.7	20.0	104	61 - 132	33 *	30
Acetone	14.4	20.0	72	17.2	20.0	86	54 - 139	18	30
Benzene	16.6	20.0	83	20.3	20.0	102	78 - 121	20	30
Bromodichloromethane	17.8	20.0	89	21.7	20.0	109	80 - 125	20	30
Bromoform	16.6	20.0	83	22.6	20.0	113	68 - 130	31 *	30
Bromomethane	12.6	20.0	63	15.8	20.0	79	57 - 144	23	30
Carbon Disulfide	20.3	20.0	102	25.5	20.0	127	52 - 140	22	30
Carbon Tetrachloride	16.2	20.0	81	21.6	20.0	108	68 - 133	29	30
Chlorobenzene	16.7	20.0	84	22.1	20.0	111	80 - 121	28	30
Chloroethane	17.0	20.0	85	23.5	20.0	117	71 - 130	32 *	30
Chloroform	18.6	20.0	93	24.2	20.0	121	78 - 125	26	30
Chloromethane	17.2	20.0	86	22.3	20.0	112	61 - 138	26	30
Dibromochloromethane	18.0	20.0	90	23.6	20.0	118	78 - 133	27	30
Dichloromethane	16.9	20.0	85	21.9	20.0	109	75 - 125	26	30
Ethylbenzene	17.1	20.0	85	21.6	20.0	108	78 - 123	23	30
Styrene	17.2	20.0	86	22.4	20.0	112	80 - 132	26	30
Tetrachloroethene (PCE)	17.0	20.0	85	21.9	20.0	109	72 - 131	25	30
Toluene	17.0	20.0	85	21.5	20.0	108	78 - 122	23	30
Trichloroethene (TCE)	16.0	20.0	80	20.2	20.0	101	74 - 127	23	30
Vinyl Chloride	18.1	20.0	91	21.5	20.0	107	72 - 138	17	30
cis-1,2-Dichloroethene	16.7	20.0	83	22.1	20.0	111	78 - 122	28	30
cis-1,3-Dichloropropene	16.6	20.0	83	20.4	20.0	102	77 - 125	21	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/25/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281447

Analyte Name	Lab Control Sample RQ1202101-03			Duplicate Lab Control Sample RQ1202101-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
m,p-Xylenes	34.2	40.0	86	45.1	40.0	113	79 - 126	27	30
n-Butyl Acetate	15.0	20.0	75	20.2	20.0	101	31 - 144	29	30
o-Xylene	17.4	20.0	87	22.1	20.0	111	77 - 118	24	30
trans-1,2-Dichloroethene	18.3	20.0	91	22.3	20.0	112	75 - 121	20	30
trans-1,3-Dichloropropene	17.6	20.0	88	21.1	20.0	105	69 - 127	18	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/27/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281525

**Lab Control Sample
 RQ1202040-07**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	23.0	20.0	115	72 - 128
1,1,2,2-Tetrachloroethane	24.1	20.0	120	72 - 131
1,1,2-Trichloroethane	21.9	20.0	109	80 - 122
1,1-Dichloroethane (1,1-DCA)	23.3	20.0	116	76 - 124
1,1-Dichloroethene (1,1-DCE)	23.8	20.0	119	72 - 129
1,2-Dichloroethane	21.7	20.0	108	73 - 127
1,2-Dichloropropane	21.1	20.0	105	80 - 123
n-Butanol	1190	1000	119	70 - 130
2-Butanone (MEK)	21.3	20.0	106	60 - 133
2-Hexanone	22.4	20.0	112	61 - 131
4-Methyl-2-pentanone	19.8	20.0	99	61 - 132
Acetone	19.0	20.0	95	54 - 139
Benzene	21.7	20.0	109	78 - 121
Bromodichloromethane	21.5	20.0	108	80 - 125
Bromoform	19.9	20.0	99	68 - 130
Bromomethane	17.1	20.0	86	57 - 144
Carbon Disulfide	25.0	20.0	125	52 - 140
Carbon Tetrachloride	20.3	20.0	102	68 - 133
Chlorobenzene	22.1	20.0	110	80 - 121
Chloroethane	22.2	20.0	111	71 - 130
Chloroform	24.7	20.0	123	78 - 125
Chloromethane	23.7	20.0	118	61 - 138
Dibromochloromethane	20.6	20.0	103	78 - 133
Dichloromethane	22.7	20.0	113	75 - 125
Ethylbenzene	22.5	20.0	112	78 - 123
Styrene	22.1	20.0	110	80 - 132
Tetrachloroethene (PCE)	22.2	20.0	111	72 - 131
Toluene	22.6	20.0	113	78 - 122
Trichloroethene (TCE)	20.7	20.0	104	74 - 127
Vinyl Chloride	23.1	20.0	115	72 - 138
cis-1,2-Dichloroethene	21.8	20.0	109	78 - 122
cis-1,3-Dichloropropene	20.8	20.0	104	77 - 125

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/27/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281525

Lab Control Sample
RQ1202040-07

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	45.5	40.0	114	79 - 126
n-Butyl Acetate	20.0	49.9	40	31 - 144
o-Xylene	22.4	20.0	112	77 - 118
trans-1,2-Dichloroethene	22.9	20.0	115	75 - 121
trans-1,3-Dichloropropene	21.5	20.0	107	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/27/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281576

Analyte Name	Lab Control Sample RQ1202055-03			Duplicate Lab Control Sample RQ1202055-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	20.3	20.0	102	18.3	20.0	91	68 - 129	10	30
1,1,2,2-Tetrachloroethane	20.5	20.0	103	20.0	20.0	100	72 - 133	3	30
1,1,2-Trichloroethane	21.6	20.0	108	20.4	20.0	102	75 - 123	5	30
1,1-Dichloroethane (1,1-DCA)	20.1	20.0	101	19.1	20.0	96	71 - 129	5	30
1,1-Dichloroethene (1,1-DCE)	20.4	20.0	102	20.4	20.0	102	71 - 133	<1	30
1,2-Dichloroethane	20.1	20.0	101	18.6	20.0	93	69 - 129	8	30
1,2-Dichloropropane	21.6	20.0	108	20.0	20.0	100	76 - 123	7	30
n-Butanol	1070	1000	107	936	1000	93	70 - 130	14	30
2-Butanone (MEK)	19.4	20.0	97	17.1	20.0	86	69 - 129	12	30
2-Hexanone	22.3	20.0	111	22.5	20.0	113	62 - 130	1	30
4-Methyl-2-pentanone	22.5	20.0	113	21.4	20.0	107	64 - 136	5	30
Acetone	21.1	20.0	106	18.9	20.0	94	53 - 148	11	30
Benzene	22.2	20.0	111	20.7	20.0	103	74 - 120	7	30
Bromodichloromethane	19.9	20.0	100	19.6	20.0	98	74 - 123	1	30
Bromoform	21.4	20.0	107	20.8	20.0	104	67 - 129	3	30
Bromomethane	16.2	20.0	81	14.5	20.0	72	53 - 143	11	30
Carbon Disulfide	23.4	20.0	117	21.1	20.0	105	58 - 139	10	30
Carbon Tetrachloride	23.2	20.0	116	20.3	20.0	101	62 - 136	14	30
Chlorobenzene	22.5	20.0	113	21.8	20.0	109	72 - 126	3	30
Chloroethane	21.1	20.0	106	20.1	20.0	101	69 - 136	5	30
Chloroform	18.5	20.0	93	18.7	20.0	94	72 - 128	1	30
Chloromethane	26.8	20.0	134	26.0	20.0	130	60 - 140	3	30
Dibromochloromethane	20.8	20.0	104	20.4	20.0	102	70 - 133	2	30
Dichloromethane	20.3	20.0	101	19.1	20.0	96	75 - 122	6	30
Ethylbenzene	23.3	20.0	116	21.7	20.0	108	68 - 129	7	30
Styrene	22.3	20.0	111	21.6	20.0	108	68 - 125	3	30
Tetrachloroethene (PCE)	25.7	20.0	129	23.9	20.0	119	64 - 133	7	30
Toluene	24.5	20.0	123	23.5	20.0	117	70 - 126	4	30
Trichloroethene (TCE)	22.2	20.0	111	20.9	20.0	105	71 - 125	6	30
Vinyl Chloride	23.0	20.0	115	21.4	20.0	107	65 - 143	7	30
cis-1,2-Dichloroethene	20.5	20.0	103	19.3	20.0	96	74 - 125	6	30
cis-1,3-Dichloropropene	20.7	20.0	104	20.3	20.0	101	71 - 118	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: LC34 Soils 2/13/12/ TR0272
Sample Matrix: Soil

Service Request: R1201033
Date Analyzed: 2/27/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 281576

Analyte Name	Lab Control Sample RQ1202055-03			Duplicate Lab Control Sample RQ1202055-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
m,p-Xylenes	48.8	40.0	122	46.1	40.0	115	68 - 129	6	30
n-Butyl Acetate	20.5	20.0	102	19.2	20.0	96	52 - 143	6	30
o-Xylene	23.0	20.0	115	21.8	20.0	109	69 - 127	5	30
trans-1,2-Dichloroethene	21.7	20.0	109	20.2	20.0	101	71 - 127	7	30
trans-1,3-Dichloropropene	18.8	20.0	94	19.1	20.0	96	70 - 120	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Project Name LC34		Project Number TR0272		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager Cory Repta		Email Address CRepta@Geosyntec.com		PRESERVATIVE	
Company/Address 6710 S Washington Ave Troyville, FL		Firm Address Geosyntec		NUMBER OF CONTAINERS 8260 (VOC/BA)	
Phone # 321 269 5880		FAX#		PRESERVATIVE KEY	
Sample Signature [Signature]		Sample's Printed Name DAVID SIMON		0. NONE 1. HCL 2. HNO ₃ 3. H ₂ SO ₄ 4. NaOH 5. Zn. Acetate 6. MeOH 7. NaHSO ₄ 8. Other ICE	
CLIENT SAMPLE ID	LAB ID	DATE	SAMPLING TIME	MATRIX	REMARKS/ ALTERNATE DESCRIPTION
LC34-DPT0332-037.0	-2012-02-13	2/13/12	848	Sub	100% as per client email DPT03416 VS 2/15/12
LC34-DPT0332-040.0	-2012-02-13		858		
LC34-DPT0332-042.5	-2012-02-13		909		
LC34-DPT0332-046.5	-2012-02-13		930		
LC34-DPT0332-045.0	-2012-02-13		919		
LC34-DPT0332-048.0	-2012-02-13		942		
LC34-DPT0332-053.0	-2012-02-13		953		
LC34-DPT0332-055.0	-2012-02-13		1006		
LC34-DPT0333-057.0	-2012-02-13		1035		
LC34-DPT0333-040.0	-2012-02-13		1045		

SPECIAL INSTRUCTIONS/COMMENTS

TURNAROUND REQUIREMENTS
 RUSH (SURCHARGES APPLY)
 STANDARD
 REQUESTED FAX DATE _____
 REQUESTED REPORT DATE _____

REPORT REQUIREMENTS
 I. Results Only
 II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
 III. Results + QC and Calibration Summaries
 IV. Data Validation Report with Raw Data
 V. Specialized Forms / Custom

INVOICE INFORMATION
 PO# _____
 BILL TO: _____

See QAPP

SAMPLE RECEIPT: CONDITION/COOLER TEMP: **2.1°C - 5.7°C** CUSTODY SEALS: **Y N**

RELINQUISHED BY [Signature]	RECEIVED BY [Signature]
Signature DAVID SIMON	Signature Cory Repta
Printed Name DAVID SIMON	Printed Name Cory Repta
Firm Geosyntec	Firm Geosyntec
Date/Time 2/14/12 1700	Date/Time 2/15/12 0945

R1201033
 GeoSyntec Consultants
 LC34 Soils 2/13/12



Project Name		Project Number		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
LC34		TR0277			
Project Manager		Email Address		PRESERVATIVE	
Cory Rapp		C.Rapp@caslab.com			
Company Address		FAX #		NUMBER OF CONTAINERS	
6770m Geosyntec 6770 S Washington Ave Titusville, FL					
Phone #		Sampler's Signature			
3212655880		David Szemore			
CLIENT SAMPLE ID	LAB ID	SAMPLING DATE	TIME	MATRIX	
LC34-DPT033445	2012-02-13	2/13/12	1055	Soil	X Oil and gas client email DPT0347 vbaled
LC34-DPT0333-047.0	2012-02-13		1107		
LC34-DPT0333-050.0	2012-02-13		1115		
LC34-DPT0333-050.5	2012-02-13		1126		
LC34-DPT0333-053.0	2012-02-13		1135		
LC34-DPT0334-034.5	2012-02-13		1250		
LC34-DPT0334-037.0	2012-02-13		1300		
LC34-DPT0334-040.0	2012-02-13		1311		
LC34-DPT0334-045.5	2012-02-13		1312		
LC34-DPT0334-047.0	2012-02-13		1321		
SPECIAL INSTRUCTIONS/COMMENTS					
TURNAROUND REQUIREMENTS					
RUSH (SURCHARGES APPLY)					
X STANDARD					
REQUESTED FAX DATE					
REQUESTED REPORT DATE					
REPORT REQUIREMENTS					
I. Results Only					
X II. Results + QC Summaries (LCS, DUP, MS/MSD as required)					
III. Results + CC and Calibration Summaries					
IV. Data Validation Report with Raw Data					
V. Specialized Forms / Custom Report					
Eccola X Yes No					
INVOICE INFORMATION					
PO#					
BILL TO:					
RECEIVED BY					
RELINQUISHED BY					
Signature					
Printed Name					
Firm					
Date/Time					
Signature					
Printed Name					
Firm					
Date/Time					
Signature					
Printed Name					
Firm					
Date/Time					

See OAPP

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 22.0C - 7.70C CUSTODY SEALS: Y (N)

RECEIVED BY

RECEIVED BY

RECEIVED BY

RECEIVED BY

RECEIVED BY

RECEIVED BY

Signature: [Signature]
Printed Name: David Szemore
Firm: Geosyntec
Date/Time: 2/13/12 1700

Signature: [Signature]
Printed Name: [Signature]
Firm: [Signature]
Date/Time: [Signature]

Signature: [Signature]
Printed Name: Amy Hentschke
Firm: [Signature]
Date/Time: 2/15/12 0945

Signature: [Signature]
Printed Name: Amy Hentschke
Firm: [Signature]
Date/Time: [Signature]

Signature: [Signature]
Printed Name: [Signature]
Firm: [Signature]
Date/Time: [Signature]

Signature: [Signature]
Printed Name: [Signature]
Firm: [Signature]
Date/Time: [Signature]



Cooler Receipt and Preservation Check Form

Project/Client Neosytec Folder Number R1201033

Cooler received on 2/15/12 by: AO COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/RCO, CLIENT
 - Temperature of cooler(s) upon receipt: 5.7° 3.2° 4.6° 2.1°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/15/12 0952

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location R002 by AO on 2/15/12 at 1000
 5035 samples placed in storage location F05 by AO on 2/15/12 at 1000

PC Secondary Review: AO 2/15/12

Cooler Breakdown: Date: 2/15/12 Time: 1330 by: AO

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent			Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
2	HNO ₃								
≤	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: MeOH lot: 102411-3 shipped 10/24/11, 1-286-002, 797-002, 102411-3

Other Comments: * but see email

PC Secondary Review: AO 3/20/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



March 05, 2012

Service Request No: R1201031

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 2/14-16/12/ TR0272A

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory between February 15, 2012 and February 17, 2012. For your reference, these analyses have been assigned our service request number **R1201031**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 275



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Environmental

www.caslab.com ■ www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

00001

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272A 2/14-16/12
Sample Matrix: Water

Service Request No.: R1201031
Date Received: 2/15-17/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Forty-eight (48) water samples were collected by the client over the period 2/14-16/12 and were received for analysis at Columbia Analytical Services from 2/15-17/12 via a national courier. The samples were received at a cooler temperature range of 2.1-5.7°C within the guidelines of 0-6°C. A Trip Blank vial was received broken in the 2/16/12 shipment. Bubbles were noted in some sample aliquots. All are recorded on the Cooler Receipt and Preservation Check Forms immediately following the Chains of Custody forms. The time recorded on the chain of custody for location LC34-BW0001E-052.5-20120216 was incorrect. The correction was corrected on the chain of custody and initialed and dated as per the client's email from 2/17/12.

Volatile Organic Compounds GC/MS

Thirty-eight (38) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for %D which was outside the 20% limit for the following compounds:

- Acetone on the 2/20/12 run Analysis Lot: 280656,
- N-Butanol and Methylcyclohexane on the 2/20/12 run Analysis Lot : 280661,
- Acetone and Cyclohexane on the 2/21/12 run,
- 2-Butanone, Acetone, Chloromethane, Cyclohexane, Dichlorodifluoromethane, Methylcyclohexane, on the 2/22/12 run,
- and Acetone and Dichlorodifluoromethane on the 2/23/12 run.

Any hits for these compounds on the associated runs should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Site QC was requested and included in the report for locations LC34-IW0071D-I-040.5-20120215 and LC34-IW0002D1-052.5-20120216 (R1201031-029 and -052 respectively). QC was not requested but is included for location LC34-IDW-185539-2012-216D (R1201031-057) All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within QC acceptance limits. The Laboratory Control Samples (LCS) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for a low level hit of 1,2,4-Trichlorobenzene on the 2/23/12 blank.

Approved by Taron Bunker Date 3/6/12

No other analytical or QC problems were encountered.

Volatile Organics GC

Twenty-five (25) samples were analyzed for Organic Acids by HPLC and GC Method RSK-175.

Initial and Continuing Calibration Criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Site QC is included in the report for locations LC34-BW0002A-024.5-20120215 (R1201031-017) for Organic Acids and LC34-BW0003D-045.5-20120215 (R1201031-022) for RSK-175. All Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were within acceptance limits. The Acetic Acid was spiked too low to be accurately determined. The recoveries for this compound have been flagged as "#". The Laboratory Control Samples (LCS) and LCS Duplicate (LSCD) recoveries were all within QC limit. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample. Organic Acids were analyzed within the proper holding time.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganic Parameters

Thirty-one (31) water samples were analyzed for TOC by method 9060A, fourteen (14) waters for Alkalinity by method SM 2320B, Sulfide by method SM 4500-S2-F and Bromide, Iodide, Chloride, Nitrate, and Sulfate by IC method 300.0 and Nitrite by method 353.2. Thirteen (13) water samples were analyzed for dissolved metals by ICP method 6010C. These soluble metals were filtered in the laboratory upon receipt of the samples.

All initial and continuing calibration criteria were met for these analyses.

Site QC is included in the report for all requested locations except for Nitrite. An alternate location was analyzed for this parameter due to a laboratory error. Also, Sulfide had insufficient volume for full QC, 3 bottles are required and only 2 were received, so a replicate was analyzed for the requested location. Additional Site QC is also included for Alkalinity and some of the anion compounds. All Matrix Spike and Matrix Spike Duplicate recoveries were within acceptance limits except for Chloride which was outside limits low for both samples. The recoveries have been flagged as "**". All Laboratory Control Sample (LCS) and LCS Duplicate recoveries were within QC limits. The Relative Percent Difference (RPD) calculations were also acceptable for all compounds.

All samples were analyzed within holding times for these analyses.

All Laboratory Method Blanks were free from contamination.

No problems were encountered during the analysis of these samples.

Approved by Juan Berube Date 3/6/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1201031

<u>Lab ID</u>	<u>Client ID</u>
R1201031-001	LC34-RW0007-038.5-20120214
R1201031-002	LC34-RW0007-038.5-20120214
R1201031-003	LC34-RW0008-052.0-20120214
R1201031-004	LC34-RW0008-052.0-20120214
R1201031-005	LC34-BW0002C-038.5-20120214
R1201031-006	LC34-BW0002D-045.5-20120214
R1201031-007	LC34-BW0002E-052.5-20120214
R1201031-008	LC34-BW0002F-059.5-20120214
R1201031-009	LC34-IW0067D-040.5-20120214
R1201031-010	LC34-IW0067D1-068.0-20120214
R1201031-011	LC34-IW0071D1-070.0-20120214
R1201031-012	LC34-FD-20120214-01
R1201031-013	LC34-FD-20120214-02
R1201031-014	LC34-FD-20120214-03
R1201031-015	LC34-TB-20120214-01
R1201031-016	LC34-TB-20120214-02
R1201031-017	LC34-BW0002A-024.5-20120215
R1201031-018	LC34-BW0002B-031.5-20120215
R1201031-019	LC34-BW0003A-024.5-20120215
R1201031-020	LC34-BW0003B-031.5-20120215
R1201031-021	LC34-BW0003C-038.5-20120215
R1201031-022	LC34-BW0003D-045.5-20120215
R1201031-023	LC34-BW0003E-052.5-20120215
R1201031-024	LC34-BW0003F-059.5-20120215
R1201031-025	LC34-IW0002I-027.5-20120215
R1201031-026	LC34-IW0002I-027.5-20120215 Dissolved
R1201031-027	LC34-IW0070D-040.5-20120215
R1201031-028	LC34-IW0070D1-070.0-20120215
R1201031-029	LC34-IW0071D-040.5-20120215
R1201031-030	LC34-IW0076-075.0-20120215
R1201031-031	LC34-IW0076-075.0-20120215 Dissolved
R1201031-032	LC34-FD-20120215-01
R1201031-033	LC34-FD-20120215-02
R1201031-034	LC34-FD-20120215-03
R1201031-035	LC34-TB-20120215-01
R1201031-036	LC34-TB-20120215-02
R1201031-037	LC34-TB-20120215-03
R1201031-038	LC34-BW0001A-024.5-20120216
R1201031-039	LC34-BW0001A-024.5-20120216 Dissolved
R1201031-040	LC34-BW0001B-031.5-20120216
R1201031-041	LC34-BW0001B-031.5-20120216 Dissolved
R1201031-042	LC34-BW0001C-038.5-20120216
R1201031-043	LC34-BW0001C-038.5-20120216 Dissolved
R1201031-044	LC34-BW0001D-045.5-20120216

<u>Lab ID</u>	<u>Client ID</u>
R1201031-045	LC34-BW0001D-045.5-20120216 Dissolved
R1201031-046	LC34-BW0001E-052.5-20120216
R1201031-047	LC34-BW0001E-052.5-20120216 Dissolved
R1201031-048	LC34-BW0001F-059.5-20120216
R1201031-049	LC34-BW0001F-059.5-20120216 Dissolved
R1201031-050	LC34-IW0002D-037.5-20120216
R1201031-051	LC34-IW0002D-037.5-20120216 Dissolved
R1201031-052	LC34-IW0002D1-052.5-20120216
R1201031-053	LC34-IW0002D1-052.5-20120216 Dissolved
R1201031-054	LC34-FD-20120216-01
R1201031-055	LC34-FD-20120216-02
R1201031-056	LC34-FD-20120216-03
R1201031-057	LC34-IDW-185539-20120216
R1201031-058	LC34-TB-20120216-01

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-001

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	390		mg/L	2.0	1	NA	2/16/12 13:53	
Bromide	300.0	8.0		mg/L	1.0	10	NA	2/15/12 18:23	
Carbon, Total Organic (TOC), Average	9060A	108		mg/L	10	10	NA	2/23/12 10:01	
Chloride	300.0	409		mg/L	20	100	NA	2/15/12 19:26	
Iodide	300.0	7.2		mg/L	2.0	10	NA	2/28/12 16:23	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/15/12 18:23	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/15/12 20:10	
Sulfate	300.0	4.2		mg/L	2.0	10	NA	2/15/12 18:23	
Sulfide, Total	SM 4500-S2- F	15.1		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-002

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 22:27	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/16/12	2/20/12 22:27	
Manganese, Dissolved	6010C	15		µg/L	10	1	2/16/12	2/20/12 22:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12
Date Analyzed: 2/20/12 14:40

Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8395.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5600	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250 U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	19	
106-93-4	1,2-Dibromoethane	250 U	250	10	
95-50-1	1,2-Dichlorobenzene	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	15	
541-73-1	1,3-Dichlorobenzene	250 U	250	10	
106-46-7	1,4-Dichlorobenzene	250 U	250	10	
71-36-3	n-Butanol	13000 U	13000	530	
78-93-3	2-Butanone (MEK)	500 U	500	26	
591-78-6	2-Hexanone	500 U	500	18	
108-10-1	4-Methyl-2-pentanone	500 U	500	14	
67-64-1	Acetone	500 U	500	49	
71-43-2	Benzene	250 U	250	11	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	14	
74-83-9	Bromomethane	250 U	250	16	
75-15-0	Carbon Disulfide	500 U	500	10	
56-23-5	Carbon Tetrachloride	250 U	250	14	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	16	
67-66-3	Chloroform	250 U	250	11	
74-87-3	Chloromethane	250 U	250	12	
110-82-7	Cyclohexane	500 U	500	12	
124-48-1	Dibromochloromethane	250 U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250 U	250	29	
75-09-2	Dichloromethane	250 U	250	11	
100-41-4	Ethylbenzene	250 U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12
Date Analyzed: 2/20/12 14:40

Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8395.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	560		250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	6400		250	12	
156-59-2	cis-1,2-Dichloroethene	8900		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	250	U	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	250	I	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	2/20/12 14:40	
Dibromofluoromethane	105	89-119	2/20/12 14:40	
Toluene-d8	103	87-121	2/20/12 14:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12
Date Analyzed: 2/22/12 14:17

Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1454.run

Analysis Lot: 280938
Instrument Name: R-GC-02
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	37		20	
74-85-1	Ethene	500		20	
74-82-8	Methane	1100		40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1018
Date Received: 2/15/12
Date Analyzed: 2/20/12 15:29

Sample Name: LC34-RW0007-038.5-20120214
Lab Code: R1201031-001

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007438.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	170	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	49	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	4.9	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-003

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	300		mg/L	2.0	1	NA	2/16/12 13:53	
Bromide	300.0	4.3		mg/L	1.0	10	NA	2/15/12 18:39	
Carbon, Total Organic (TOC), Average	9060A	43.5		mg/L	4.0	4	NA	2/23/12 12:03	
Chloride	300.0	621		mg/L	20	100	NA	2/15/12 19:42	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 16:46	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/15/12 18:39	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/15/12 20:11	
Sulfate	300.0	2.9		mg/L	2.0	10	NA	2/15/12 18:39	
Sulfide, Total	SM 4500-S2- F	13.3		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-004

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 22:33	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/16/12	2/20/12 22:33	
Manganese, Dissolved	6010C	12		µg/L	10	1	2/16/12	2/20/12 22:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12
Date Analyzed: 2/20/12 15:10

Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8396.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	850		50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	
106-93-4	1,2-Dibromoethane	50	U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.0	
107-06-2	1,2-Dichloroethane	50	U	50	2.0	
78-87-5	1,2-Dichloropropane	50	U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	2500	U	2500	110	
78-93-3	2-Butanone (MEK)	100	U	100	5.1	
591-78-6	2-Hexanone	100	U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100	U	100	2.7	
67-64-1	Acetone	100	U	100	9.8	
71-43-2	Benzene	50	U	50	2.1	
75-27-4	Bromodichloromethane	50	U	50	2.0	
75-25-2	Bromoform	50	U	50	2.7	
74-83-9	Bromomethane	50	U	50	3.1	
75-15-0	Carbon Disulfide	100	U	100	2.0	
56-23-5	Carbon Tetrachloride	50	U	50	2.7	
108-90-7	Chlorobenzene	50	U	50	2.0	
75-00-3	Chloroethane	50	U	50	3.1	
67-66-3	Chloroform	50	U	50	2.2	
74-87-3	Chloromethane	50	U	50	2.4	
110-82-7	Cyclohexane	100	U	100	2.4	
124-48-1	Dibromochloromethane	50	U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	
75-09-2	Dichloromethane	50	U	50	2.2	
100-41-4	Ethylbenzene	50	U	50	2.0	
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12
Date Analyzed: 2/20/12 15:10

Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8396.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	570		50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	670		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1100		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	14	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	94	85-122	2/20/12 15:10	
Dibromofluoromethane	106	89-119	2/20/12 15:10	
Toluene-d8	104	87-121	2/20/12 15:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-003

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	13		5.0	5	NA	2/22/12 12:57		280938	
Ethene	450		5.0	5	NA	2/22/12 12:57		280938	
Methane	510		20	10	NA	2/22/12 13:11		280938	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1110
Date Received: 2/15/12
Date Analyzed: 2/22/12 00:09

Sample Name: LC34-RW0008-052.0-20120214
Lab Code: R1201031-003

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007500.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	91		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	4.8		2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.2		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120214
Lab Code: R1201031-005

Service Request: R1201031
Date Collected: 2/14/12 1444
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	233		mg/L	2.0	1	NA	2/16/12 13:53	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/15/12 18:54	
Carbon, Total Organic (TOC), Average	9060A	2.5		mg/L	1.0	1	NA	2/24/12 21:37	
Chloride	300.0	50.5		mg/L	2.0	10	NA	2/17/12 16:15	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 16:54	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/15/12 18:54	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/15/12 20:11	
Sulfate	300.0	26.2		mg/L	2.0	10	NA	2/15/12 18:54	
Sulfide, Total	SM 4500-S2- F	2.4		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/14-16/12/ TR0272A
 Sample Matrix: Water

Service Request: R1201031
 Date Collected: 2/14/12 1444
 Date Received: 2/15/12
 Date Analyzed: 2/20/12 15:40

Sample Name: LC34-BW0002C-038.5-20120214
 Lab Code: R1201031-005

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8397.D\

Analysis Lot: 280661
 Instrument Name: R-MS-10
 Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	25	U	25	1.2	
79-34-5	1,1,2,2-Tetrachloroethane	25	U	25	1.0	
79-00-5	1,1,2-Trichloroethane	25	U	25	1.2	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	44		25	1.6	
75-34-3	1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	25	U	25	1.5	
120-82-1	1,2,4-Trichlorobenzene	25	U	25	1.3	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	
106-93-4	1,2-Dibromoethane	25	U	25	1.0	
95-50-1	1,2-Dichlorobenzene	25	U	25	1.0	
107-06-2	1,2-Dichloroethane	25	U	25	1.0	
78-87-5	1,2-Dichloropropane	25	U	25	1.5	
541-73-1	1,3-Dichlorobenzene	25	U	25	1.0	
106-46-7	1,4-Dichlorobenzene	25	U	25	1.0	
71-36-3	n-Butanol	1300	U	1300	53	
78-93-3	2-Butanone (MEK)	50	U	50	2.6	
591-78-6	2-Hexanone	50	U	50	1.8	
108-10-1	4-Methyl-2-pentanone	50	U	50	1.4	
67-64-1	Acetone	50	U	50	4.9	
71-43-2	Benzene	25	U	25	1.1	
75-27-4	Bromodichloromethane	25	U	25	1.0	
75-25-2	Bromoform	25	U	25	1.4	
74-83-9	Bromomethane	25	U	25	1.6	
75-15-0	Carbon Disulfide	50	U	50	1.0	
56-23-5	Carbon Tetrachloride	25	U	25	1.4	
108-90-7	Chlorobenzene	25	U	25	1.0	
75-00-3	Chloroethane	25	U	25	1.6	
67-66-3	Chloroform	25	U	25	1.1	
74-87-3	Chloromethane	25	U	25	1.2	
110-82-7	Cyclohexane	50	U	50	1.2	
124-48-1	Dibromochloromethane	25	U	25	1.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	
75-09-2	Dichloromethane	25	U	25	1.1	
100-41-4	Ethylbenzene	25	U	25	1.0	
98-82-8	Isopropylbenzene (Cumene)	25	U	25	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1444
Date Received: 2/15/12
Date Analyzed: 2/20/12 15:40

Sample Name: LC34-BW0002C-038.5-20120214
Lab Code: R1201031-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8397.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	50 U	50	1.2	
1634-04-4	Methyl tert-Butyl Ether	25 U	25	1.0	
108-87-2	Methylcyclohexane	50 U	50	1.3	
100-42-5	Styrene	25 U	25	1.0	
127-18-4	Tetrachloroethene (PCE)	25 U	25	1.0	
108-88-3	Toluene	25 U	25	1.0	
79-01-6	Trichloroethene (TCE)	2.1 I	25	1.2	
75-69-4	Trichlorofluoromethane (CFC 11)	25 U	25	1.0	
75-01-4	Vinyl Chloride	620	25	1.2	
156-59-2	cis-1,2-Dichloroethene	580	25	1.0	
10061-01-5	cis-1,3-Dichloropropene	25 U	25	1.0	
179601-23-1	m,p-Xylenes	25 U	25	1.0	
123-86-4	n-Butyl Acetate	25 U	25	1.1	
95-47-6	o-Xylene	25 U	25	1.0	
156-60-5	trans-1,2-Dichloroethene	54	25	1.0	
10061-02-6	trans-1,3-Dichloropropene	25 U	25	1.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	2/20/12 15:40	
Dibromofluoromethane	107	89-119	2/20/12 15:40	
Toluene-d8	103	87-121	2/20/12 15:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1444
Date Received: 2/15/12
Date Analyzed: 2/22/12 13:43

Sample Name: LC34-BW0002C-038.5-20120214
Lab Code: R1201031-005

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1452.run

Analysis Lot: 280938
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	2.0 U	2.0	
74-85-1	Ethene	170	2.0	
74-82-8	Methane	140	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1444
Date Received: 2/15/12
Date Analyzed: 2/20/12 17:36

Sample Name: LC34-BW0002C-038.5-20120214
Lab Code: R1201031-005

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007442.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20120214
Lab Code: R1201031-006

Service Request: R1201031
Date Collected: 2/14/12 1410
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	6.5	mg/L	1.0	10	NA	2/20/12 23:46	
Carbon, Total Organic (TOC), Average	9060A	88	mg/L	10	10	NA	2/24/12 22:18	
Iodide	300.0	2.8	mg/L	2.0	10	NA	2/28/12 17:02	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1410
Date Received: 2/15/12
Date Analyzed: 2/17/12 18:39

Sample Name: LC34-BW0002D-045.5-20120214
Lab Code: R1201031-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\021712\D8379.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	52 I	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	25000 U	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	1000 U	1000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	1000 U	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	500 U	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	
98-82-8	Isopropylbenzene (Cumene)	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1410
Date Received: 2/15/12
Date Analyzed: 2/17/12 18:39

Sample Name: LC34-BW0002D-045.5-20120214
Lab Code: R1201031-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8379.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	70	I	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	29	I	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	6500		500	23	
156-59-2	cis-1,2-Dichloroethene	13000		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	500	U	500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	120	I	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	2/17/12 18:39	
Dibromofluoromethane	102	89-119	2/17/12 18:39	
Toluene-d8	98	87-121	2/17/12 18:39	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20120214
Lab Code: R1201031-006

Service Request: R1201031
Date Collected: 2/14/12 1410
Date Received: 2/15/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	41		1.0	1	NA	2/23/12 09:39		281108	
Ethene	180		2.5	2.5	NA	2/23/12 09:50		281108	
Methane	110		5.0	2.5	NA	2/23/12 09:50		281108	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1410
Date Received: 2/15/12
Date Analyzed: 2/20/12 19:11

Sample Name: LC34-BW0002D-045.5-20120214
Lab Code: R1201031-006

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007445.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	190	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	20	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	2.1	1.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20120214
Lab Code: R1201031-007

Service Request: R1201031
Date Collected: 2/14/12 1326
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.0		mg/L	1.0	10	NA	2/21/12 00:21	
Carbon, Total Organic (TOC), Average	9060A	4.6		mg/L	1.0	1	NA	2/24/12 00:20	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 17:09	

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Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/14-16/12/ TR0272A
 Sample Matrix: Water

Service Request: R1201031
 Date Collected: 2/14/12 1326
 Date Received: 2/15/12
 Date Analyzed: 2/17/12 14:39

Sample Name: LC34-BW0002E-052.5-20120214
 Lab Code: R1201031-007

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8371.D\

Analysis Lot: 280472
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	1.4 I	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.41 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1326
Date Received: 2/15/12
Date Analyzed: 2/17/12 14:39

Sample Name: LC34-BW0002E-052.5-20120214
Lab Code: R1201031-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8371.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	22	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	2.3 I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	0.62 I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	2/17/12 14:39	
Dibromofluoromethane	102	89-119	2/17/12 14:39	
Toluene-d8	98	87-121	2/17/12 14:39	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1326
Date Received: 2/15/12
Date Analyzed: 2/23/12 10:00

Sample Name: LC34-BW0002E-052.5-20120214
Lab Code: R1201031-007

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1462.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.7		1.0	
74-85-1	Ethene	90		1.0	
74-82-8	Methane	46		2.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1326
Date Received: 2/15/12
Date Analyzed: 2/20/12 20:14

Sample Name: LC34-BW0002E-052.5-20120214
Lab Code: R1201031-007

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC05\DATA\022012\X0007447.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	4.3	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120214
Lab Code: R1201031-008

Service Request: R1201031
Date Collected: 2/14/12 1245
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.0	mg/L	1.0	10	NA	2/21/12 00:32	
Carbon, Total Organic (TOC), Average	9060A	3.1	mg/L	1.0	1	NA	2/25/12 01:01	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 17:17	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1245
Date Received: 2/15/12
Date Analyzed: 2/17/12 15:09

Sample Name: LC34-BW0002F-059.5-20120214
Lab Code: R1201031-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8372.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1245
Date Received: 2/15/12
Date Analyzed: 2/17/12 15:09

Sample Name: LC34-BW0002F-059.5-20120214
Lab Code: R1201031-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8372.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	6.3	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	0.84 I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	0.40 I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	2/17/12 15:09	
Dibromofluoromethane	102	89-119	2/17/12 15:09	
Toluene-d8	98	87-121	2/17/12 15:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1245
Date Received: 2/15/12
Date Analyzed: 2/23/12 10:11

Sample Name: LC34-BW0002F-059.5-20120214
Lab Code: R1201031-008

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1463.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	6.9	1.0	
74-82-8	Methane	8.2	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1245
Date Received: 2/15/12
Date Analyzed: 2/20/12 21:17

Sample Name: LC34-BW0002F-059.5-20120214
Lab Code: R1201031-008

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007449.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0067D-040.5-20120214
Lab Code: R1201031-009

Service Request: R1201031
Date Collected: 2/14/12 1415
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.6		mg/L	1.0	1	NA	2/25/12 01:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1415
Date Received: 2/15/12
Date Analyzed: 2/17/12 15:39

Sample Name: LC34-IW0067D-040.5-20120214
Lab Code: R1201031-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8373.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1415
Date Received: 2/15/12
Date Analyzed: 2/17/12 15:39

Sample Name: LC34-IW0067D-040.5-20120214
Lab Code: R1201031-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8373.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	8.4		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	0.68	I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/17/12 15:39	
Dibromofluoromethane	102	89-119	2/17/12 15:39	
Toluene-d8	98	87-121	2/17/12 15:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0067D1-068.0-20120214
Lab Code: R1201031-010

Service Request: R1201031
Date Collected: 2/14/12 1346
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.0		mg/L	1.0	1	NA	2/25/12 02:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1346
Date Received: 2/15/12
Date Analyzed: 2/17/12 16:09

Sample Name: LC34-IW0067D1-068.0-20120214
Lab Code: R1201031-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8374.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1346
Date Received: 2/15/12
Date Analyzed: 2/17/12 16:09

Sample Name: LC34-IW0067D1-068.0-20120214
Lab Code: R1201031-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8374.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	2/17/12 16:09	
Dibromofluoromethane	102	89-119	2/17/12 16:09	
Toluene-d8	98	87-121	2/17/12 16:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0071D1-070.0-20120214
Lab Code: R1201031-011

Service Request: R1201031
Date Collected: 2/14/12 1454
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.1	mg/L	1.0	1	NA	2/25/12 03:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1454
Date Received: 2/15/12
Date Analyzed: 2/17/12 16:39

Sample Name: LC34-IW0071D1-070.0-20120214
Lab Code: R1201031-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8375.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12 1454
Date Received: 2/15/12
Date Analyzed: 2/17/12 16:39

Sample Name: LC34-IW0071D1-070.0-20120214
Lab Code: R1201031-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8375.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/17/12 16:39	
Dibromofluoromethane	102	89-119	2/17/12 16:39	
Toluene-d8	99	87-121	2/17/12 16:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120214-01
Lab Code: R1201031-012

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	2/21/12 13:43		280843	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,1,2-Trichloroethane	250	U	250	12	50	NA	2/21/12 13:43		280843	
1,1,2-Trichloro-1,2,2-trifluoroethane	9500		250	16	50	NA	2/21/12 13:43		280843	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,1-Dichloroethene (1,1-DCE)	42	I	250	15	50	NA	2/21/12 13:43		280843	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	2/21/12 13:43		280843	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	2/21/12 13:43		280843	
1,2-Dibromoethane	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,2-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,2-Dichloroethane	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,2-Dichloropropane	250	U	250	15	50	NA	2/21/12 13:43		280843	
1,3-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 13:43		280843	
1,4-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 13:43		280843	
n-Butanol	13000	U	13000	530	50	NA	2/21/12 13:43		280843	
2-Butanone (MEK)	500	U	500	26	50	NA	2/21/12 13:43		280843	
2-Hexanone	500	U	500	18	50	NA	2/21/12 13:43		280843	
4-Methyl-2-pentanone	500	U	500	14	50	NA	2/21/12 13:43		280843	
Acetone	240	I	500	49	50	NA	2/21/12 13:43		280843	
Benzene	250	U	250	11	50	NA	2/21/12 13:43		280843	
Bromodichloromethane	250	U	250	10	50	NA	2/21/12 13:43		280843	
Bromoform	250	U	250	14	50	NA	2/21/12 13:43		280843	
Bromomethane	250	U	250	16	50	NA	2/21/12 13:43		280843	
Carbon Disulfide	500	U	500	10	50	NA	2/21/12 13:43		280843	
Carbon Tetrachloride	250	U	250	14	50	NA	2/21/12 13:43		280843	
Chlorobenzene	250	U	250	10	50	NA	2/21/12 13:43		280843	
Chloroethane	250	U	250	16	50	NA	2/21/12 13:43		280843	
Chloroform	250	U	250	11	50	NA	2/21/12 13:43		280843	
Chloromethane	250	U	250	12	50	NA	2/21/12 13:43		280843	
Cyclohexane	500	U	500	12	50	NA	2/21/12 13:43		280843	
Dibromochloromethane	250	U	250	10	50	NA	2/21/12 13:43		280843	
Dichlorodifluoromethane (CFC 12)	310		250	29	50	NA	2/21/12 13:43		280843	
Dichloromethane	14	I	250	11	50	NA	2/21/12 13:43		280843	
Ethylbenzene	250	U	250	10	50	NA	2/21/12 13:43		280843	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	2/21/12 13:43		280843	
Methyl Acetate	500	U	500	12	50	NA	2/21/12 13:43		280843	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120214-01
Lab Code: R1201031-012

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	10	50	NA	2/21/12 13:43		280843	
Methylcyclohexane	500	U	500	13	50	NA	2/21/12 13:43		280843	
Styrene	250	U	250	10	50	NA	2/21/12 13:43		280843	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	2/21/12 13:43		280843	
Toluene	250	U	250	10	50	NA	2/21/12 13:43		280843	
Trichloroethene (TCE)	1100		250	12	50	NA	2/21/12 13:43		280843	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	2/21/12 13:43		280843	
Vinyl Chloride	7600		250	12	50	NA	2/21/12 13:43		280843	
cis-1,2-Dichloroethene	9100		500	20	100	NA	2/21/12 14:14		280843	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	2/21/12 13:43		280843	
m,p-Xylenes	250	U	250	10	50	NA	2/21/12 13:43		280843	
n-Butyl Acetate	250	U	250	11	50	NA	2/21/12 13:43		280843	
o-Xylene	250	U	250	10	50	NA	2/21/12 13:43		280843	
trans-1,2-Dichloroethene	210	I	250	10	50	NA	2/21/12 13:43		280843	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	2/21/12 13:43		280843	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/21/12 13:43	
Dibromofluoromethane	99	89-119	2/21/12 13:43	
Toluene-d8	99	87-121	2/21/12 13:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120214-02
Lab Code: R1201031-013

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	2/16/12	2/20/12 22:39	
Iron, Dissolved	6010C	100 U	µg/L	100	1	2/16/12	2/20/12 22:39	
Manganese, Dissolved	6010C	12	µg/L	10	1	2/16/12	2/20/12 22:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120214-03
Lab Code: R1201031-014

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	46.8	mg/L	2.0	10	NA	2/20/12 14:26	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	2/15/12 19:10	
Nitrite as Nitrogen	353.2	0.010 U	mg/L	0.010	1	NA	2/15/12 20:12	
Sulfate	300.0	25.9	mg/L	2.0	10	NA	2/15/12 19:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 13:40

Sample Name: LC34-TB-20120214-01
Lab Code: R1201031-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\021712\D8369.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 13:40

Sample Name: LC34-TB-20120214-01
Lab Code: R1201031-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8369.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	2/17/12 13:40	
Dibromofluoromethane	101	89-119	2/17/12 13:40	
Toluene-d8	98	87-121	2/17/12 13:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 14:10

Sample Name: LC34-TB-20120214-02
Lab Code: R1201031-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8370.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/14/12
Date Received: 2/15/12
Date Analyzed: 2/17/12 14:10

Sample Name: LC34-TB-20120214-02
Lab Code: R1201031-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8370.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	2/17/12 14:10	
Dibromofluoromethane	103	89-119	2/17/12 14:10	
Toluene-d8	98	87-121	2/17/12 14:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Service Request: R1201031
Date Collected: 2/15/12 1112
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.7	mg/L	1.0	10	NA	2/21/12 00:44	
Carbon, Total Organic (TOC), Average	9060A	41.0	mg/L	4.0	4	NA	2/25/12 05:06	
Iodide	300.0	2.6	mg/L	2.0	10	NA	2/28/12 17:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Service Request: R1201031
Date Collected: 2/15/12 1112
Date Received: 2/16/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	2/17/12 19:08		280472	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,1,2-Trichloroethane	500	U	500	23	100	NA	2/17/12 19:08		280472	
1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	31	100	NA	2/17/12 19:08		280472	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,1-Dichloroethene (1,1-DCE)	41	I	500	29	100	NA	2/17/12 19:08		280472	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	2/17/12 19:08		280472	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	2/17/12 19:08		280472	
1,2-Dibromoethane	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,2-Dichlorobenzene	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,2-Dichloroethane	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,2-Dichloropropane	500	U	500	29	100	NA	2/17/12 19:08		280472	
1,3-Dichlorobenzene	500	U	500	20	100	NA	2/17/12 19:08		280472	
1,4-Dichlorobenzene	500	U	500	20	100	NA	2/17/12 19:08		280472	
n-Butanol	25000	U	25000	1100	100	NA	2/17/12 19:08		280472	
2-Butanone (MEK)	1000	U	1000	51	100	NA	2/17/12 19:08		280472	
2-Hexanone	1000	U	1000	35	100	NA	2/17/12 19:08		280472	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	2/17/12 19:08		280472	
Acetone	1000	U	1000	98	100	NA	2/17/12 19:08		280472	
Benzene	500	U	500	21	100	NA	2/17/12 19:08		280472	
Bromodichloromethane	500	U	500	20	100	NA	2/17/12 19:08		280472	
Bromoform	500	U	500	27	100	NA	2/17/12 19:08		280472	
Bromomethane	500	U	500	31	100	NA	2/17/12 19:08		280472	
Carbon Disulfide	1000	U	1000	20	100	NA	2/17/12 19:08		280472	
Carbon Tetrachloride	500	U	500	27	100	NA	2/17/12 19:08		280472	
Chlorobenzene	500	U	500	20	100	NA	2/17/12 19:08		280472	
Chloroethane	500	U	500	31	100	NA	2/17/12 19:08		280472	
Chloroform	500	U	500	22	100	NA	2/17/12 19:08		280472	
Chloromethane	500	U	500	24	100	NA	2/17/12 19:08		280472	
Cyclohexane	1000	U	1000	24	100	NA	2/17/12 19:08		280472	
Dibromochloromethane	500	U	500	20	100	NA	2/17/12 19:08		280472	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	2/17/12 19:08		280472	
Dichloromethane	500	U	500	22	100	NA	2/17/12 19:08		280472	
Ethylbenzene	500	U	500	20	100	NA	2/17/12 19:08		280472	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	2/17/12 19:08		280472	
Methyl Acetate	140	I	1000	23	100	NA	2/17/12 19:08		280472	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Service Request: R1201031
Date Collected: 2/15/12 1112
Date Received: 2/16/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	500	U	500	20	100	NA	2/17/12 19:08		280472	
Methylcyclohexane	1000	U	1000	25	100	NA	2/17/12 19:08		280472	
Styrene	500	U	500	20	100	NA	2/17/12 19:08		280472	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	2/17/12 19:08		280472	
Toluene	500	U	500	20	100	NA	2/17/12 19:08		280472	
Trichloroethene (TCE)	51	I	500	23	100	NA	2/17/12 19:08		280472	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	2/17/12 19:08		280472	
Vinyl Chloride	7800		500	23	100	NA	2/17/12 19:08		280472	
cis-1,2-Dichloroethene	46000		2500	100	500	NA	2/20/12 16:09		280661	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	2/17/12 19:08		280472	
m,p-Xylenes	500	U	500	20	100	NA	2/17/12 19:08		280472	
n-Butyl Acetate	500	U	500	21	100	NA	2/17/12 19:08		280472	
o-Xylene	500	U	500	20	100	NA	2/17/12 19:08		280472	
trans-1,2-Dichloroethene	380	I	500	20	100	NA	2/17/12 19:08		280472	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	2/17/12 19:08		280472	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/17/12 19:08	
Dibromofluoromethane	104	89-119	2/17/12 19:08	
Toluene-d8	98	87-121	2/17/12 19:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1112
Date Received: 2/16/12
Date Analyzed: 2/23/12 10:31

Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1465.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	98		5.0	
74-85-1	Ethene	140		5.0	
74-82-8	Methane	410		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1112
Date Received: 2/16/12
Date Analyzed: 2/20/12 22:20

Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007451.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	100	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Service Request: R1201031
Date Collected: 2/15/12 1024
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/21/12 01:07	
Carbon, Total Organic (TOC), Average	9060A	11.4		mg/L	1.0	1	NA	2/25/12 05:46	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 17:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1024
Date Received: 2/16/12
Date Analyzed: 2/21/12 21:36

Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvov10\data\022112\D8440.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 25

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130 U	130	5.8	
79-34-5	1,1,2,2-Tetrachloroethane	130 U	130	5.0	
79-00-5	1,1,2-Trichloroethane	130 U	130	5.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	130	130	7.8	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130 U	130	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130 U	130	7.3	
120-82-1	1,2,4-Trichlorobenzene	130 U	130	6.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130 U	130	9.5	
106-93-4	1,2-Dibromoethane	130 U	130	5.0	
95-50-1	1,2-Dichlorobenzene	130 U	130	5.0	
107-06-2	1,2-Dichloroethane	130 U	130	5.0	
78-87-5	1,2-Dichloropropane	130 U	130	7.1	
541-73-1	1,3-Dichlorobenzene	130 U	130	5.0	
106-46-7	1,4-Dichlorobenzene	130 U	130	5.0	
71-36-3	n-Butanol	6300 U	6300	270	
78-93-3	2-Butanone (MEK)	250 U	250	13	
591-78-6	2-Hexanone	250 U	250	8.8	
108-10-1	4-Methyl-2-pentanone	250 U	250	6.8	
67-64-1	Acetone	250 U	250	25	
71-43-2	Benzene	130 U	130	5.3	
75-27-4	Bromodichloromethane	130 U	130	5.0	
75-25-2	Bromoform	130 U	130	6.8	
74-83-9	Bromomethane	130 U	130	7.8	
75-15-0	Carbon Disulfide	7.5 I	250	5.0	
56-23-5	Carbon Tetrachloride	130 U	130	6.8	
108-90-7	Chlorobenzene	130 U	130	5.0	
75-00-3	Chloroethane	130 U	130	7.8	
67-66-3	Chloroform	130 U	130	5.5	
74-87-3	Chloromethane	130 U	130	6.0	
110-82-7	Cyclohexane	250 U	250	6.0	
124-48-1	Dibromochloromethane	130 U	130	5.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	130 U	130	15	
75-09-2	Dichloromethane	130 U	130	5.5	
100-41-4	Ethylbenzene	130 U	130	5.0	
98-82-8	Isopropylbenzene (Cumene)	130 U	130	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1024
Date Received: 2/16/12
Date Analyzed: 2/21/12 21:36

Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022112\D8440.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	250	U	250	5.8	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	5.0	
108-87-2	Methylcyclohexane	250	U	250	6.3	
100-42-5	Styrene	130	U	130	5.0	
127-18-4	Tetrachloroethene (PCE)	130	U	130	5.0	
108-88-3	Toluene	130	U	130	5.0	
79-01-6	Trichloroethene (TCE)	41	I	130	5.8	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	5.0	
75-01-4	Vinyl Chloride	1800		130	5.8	
156-59-2	cis-1,2-Dichloroethene	4900		130	5.0	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	5.0	
179601-23-1	m,p-Xylenes	130	U	130	5.0	
123-86-4	n-Butyl Acetate	130	U	130	5.3	
95-47-6	o-Xylene	130	U	130	5.0	
156-60-5	trans-1,2-Dichloroethene	170		130	5.0	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	2/21/12 21:36	
Dibromofluoromethane	105	89-119	2/21/12 21:36	
Toluene-d8	102	87-121	2/21/12 21:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Service Request: R1201031
Date Collected: 2/15/12 1024
Date Received: 2/16/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	4.5		1.0	1	NA	2/23/12 10:43		281108	
Ethene	110		2.0	2	NA	2/23/12 11:42		281108	
Methane	150		4.0	2	NA	2/23/12 11:42		281108	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1024
Date Received: 2/16/12
Date Analyzed: 2/21/12 02:02

Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007458.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	19		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20120215
Lab Code: R1201031-019

Service Request: R1201031
Date Collected: 2/15/12 1305
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/21/12 01:18	
Carbon, Total Organic (TOC), Average	9060A	2.6		mg/L	1.0	1	NA	2/25/12 07:49	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 17:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/14-16/12/ TR0272A
 Sample Matrix: Water

Service Request: R1201031
 Date Collected: 2/15/12 1305
 Date Received: 2/16/12
 Date Analyzed: 2/21/12 14:44

Sample Name: LC34-BW0003A-024.5-20120215
 Lab Code: R1201031-019

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6420.D\

Analysis Lot: 280843
 Instrument Name: R-MS-12
 Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	250 U	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250 U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	19	
106-93-4	1,2-Dibromoethane	250 U	250	10	
95-50-1	1,2-Dichlorobenzene	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	15	
541-73-1	1,3-Dichlorobenzene	250 U	250	10	
106-46-7	1,4-Dichlorobenzene	250 U	250	10	
71-36-3	n-Butanol	13000 U	13000	530	
78-93-3	2-Butanone (MEK)	500 U	500	26	
591-78-6	2-Hexanone	500 U	500	18	
108-10-1	4-Methyl-2-pentanone	500 U	500	14	
67-64-1	Acetone	500 U	500	49	
71-43-2	Benzene	250 U	250	11	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	14	
74-83-9	Bromomethane	250 U	250	16	
75-15-0	Carbon Disulfide	500 U	500	10	
56-23-5	Carbon Tetrachloride	250 U	250	14	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	16	
67-66-3	Chloroform	250 U	250	11	
74-87-3	Chloromethane	250 U	250	12	
110-82-7	Cyclohexane	500 U	500	12	
124-48-1	Dibromochloromethane	250 U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	66 I	250	29	
75-09-2	Dichloromethane	250 U	250	11	
100-41-4	Ethylbenzene	250 U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1305
Date Received: 2/16/12
Date Analyzed: 2/21/12 14:44

Sample Name: LC34-BW0003A-024.5-20120215
Lab Code: R1201031-019

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6420.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	250	U	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	1100		250	12	
156-59-2	cis-1,2-Dichloroethene	6800		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	250	U	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	220	I	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/21/12 14:44	
Dibromofluoromethane	99	89-119	2/21/12 14:44	
Toluene-d8	100	87-121	2/21/12 14:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1305
Date Received: 2/16/12
Date Analyzed: 2/23/12 11:52

Sample Name: LC34-BW0003A-024.5-20120215
Lab Code: R1201031-019

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1471.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	5.4		1.0	
74-82-8	Methane	15		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1305
Date Received: 2/16/12
Date Analyzed: 2/21/12 03:05

Sample Name: LC34-BW0003A-024.5-20120215
Lab Code: R1201031-019

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007460.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Service Request: R1201031
Date Collected: 2/15/12 1228
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/21/12 01:53	
Carbon, Total Organic (TOC), Average	9060A	2.7		mg/L	1.0	1	NA	2/25/12 08:29	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 18:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Service Request: R1201031
Date Collected: 2/15/12 1228
Date Received: 2/16/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	2/21/12 15:15		280843	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,1,2-Trichloroethane	250	U	250	12	50	NA	2/21/12 15:15		280843	
1,1,2-Trichloro-1,2,2-trifluoroethane	31	I	250	16	50	NA	2/21/12 15:15		280843	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,1-Dichloroethene (1,1-DCE)	17	I	250	15	50	NA	2/21/12 15:15		280843	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	2/21/12 15:15		280843	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	2/21/12 15:15		280843	
1,2-Dibromoethane	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,2-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,2-Dichloroethane	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,2-Dichloropropane	250	U	250	15	50	NA	2/21/12 15:15		280843	
1,3-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 15:15		280843	
1,4-Dichlorobenzene	250	U	250	10	50	NA	2/21/12 15:15		280843	
n-Butanol	13000	U	13000	530	50	NA	2/21/12 15:15		280843	
2-Butanone (MEK)	500	U	500	26	50	NA	2/21/12 15:15		280843	
2-Hexanone	500	U	500	18	50	NA	2/21/12 15:15		280843	
4-Methyl-2-pentanone	500	U	500	14	50	NA	2/21/12 15:15		280843	
Acetone	500	U	500	49	50	NA	2/21/12 15:15		280843	
Benzene	250	U	250	11	50	NA	2/21/12 15:15		280843	
Bromodichloromethane	250	U	250	10	50	NA	2/21/12 15:15		280843	
Bromoform	250	U	250	14	50	NA	2/21/12 15:15		280843	
Bromomethane	250	U	250	16	50	NA	2/21/12 15:15		280843	
Carbon Disulfide	500	U	500	10	50	NA	2/21/12 15:15		280843	
Carbon Tetrachloride	250	U	250	14	50	NA	2/21/12 15:15		280843	
Chlorobenzene	250	U	250	10	50	NA	2/21/12 15:15		280843	
Chloroethane	250	U	250	16	50	NA	2/21/12 15:15		280843	
Chloroform	250	U	250	11	50	NA	2/21/12 15:15		280843	
Chloromethane	250	U	250	12	50	NA	2/21/12 15:15		280843	
Cyclohexane	500	U	500	12	50	NA	2/21/12 15:15		280843	
Dibromochloromethane	250	U	250	10	50	NA	2/21/12 15:15		280843	
Dichlorodifluoromethane (CFC 12)	180	I	250	29	50	NA	2/21/12 15:15		280843	
Dichloromethane	250	U	250	11	50	NA	2/21/12 15:15		280843	
Ethylbenzene	250	U	250	10	50	NA	2/21/12 15:15		280843	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	2/21/12 15:15		280843	
Methyl Acetate	500	U	500	12	50	NA	2/21/12 15:15		280843	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Service Request: R1201031
Date Collected: 2/15/12 1228
Date Received: 2/16/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	250	U	250	10	50	NA	2/21/12 15:15		280843	
Methylcyclohexane	500	U	500	13	50	NA	2/21/12 15:15		280843	
Styrene	250	U	250	10	50	NA	2/21/12 15:15		280843	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	2/21/12 15:15		280843	
Toluene	250	U	250	10	50	NA	2/21/12 15:15		280843	
Trichloroethene (TCE)	250	U	250	12	50	NA	2/21/12 15:15		280843	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	2/21/12 15:15		280843	
Vinyl Chloride	1900		250	12	50	NA	2/21/12 15:15		280843	
cis-1,2-Dichloroethene	8600		500	20	100	NA	2/22/12 14:51		281034	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	2/21/12 15:15		280843	
m,p-Xylenes	250	U	250	10	50	NA	2/21/12 15:15		280843	
n-Butyl Acetate	250	U	250	11	50	NA	2/21/12 15:15		280843	
o-Xylene	250	U	250	10	50	NA	2/21/12 15:15		280843	
trans-1,2-Dichloroethene	360		250	10	50	NA	2/21/12 15:15		280843	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	2/21/12 15:15		280843	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/21/12 15:15	
Dibromofluoromethane	99	89-119	2/21/12 15:15	
Toluene-d8	100	87-121	2/21/12 15:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1228
Date Received: 2/16/12
Date Analyzed: 2/23/12 12:14

Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1473.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	11	1.0	
74-82-8	Methane	24	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1228
Date Received: 2/16/12
Date Analyzed: 2/21/12 04:08

Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007462.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.0	U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Service Request: R1201031
Date Collected: 2/15/12 1150
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	308		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/16/12 13:52	
Carbon, Total Organic (TOC), Average	9060A	6.2		mg/L	1.0	1	NA	2/25/12 09:10	
Chloride	300.0	237		mg/L	10	50	NA	2/17/12 17:47	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 18:27	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/16/12 13:52	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/16/12 18:23	
Sulfate	300.0	35.3		mg/L	2.0	10	NA	2/16/12 13:52	
Sulfide, Total	SM 4500-S2- F	4.2		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Service Request: R1201031
Date Collected: 2/15/12 1150
Date Received: 2/16/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	2/20/12 21:26		280656	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,1,2-Trichloroethane	250	U	250	12	50	NA	2/20/12 21:26		280656	
1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	50	NA	2/20/12 21:26		280656	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,1-Dichloroethene (1,1-DCE)	18	I	250	15	50	NA	2/20/12 21:26		280656	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	2/20/12 21:26		280656	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	2/20/12 21:26		280656	
1,2-Dibromoethane	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,2-Dichlorobenzene	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,2-Dichloroethane	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,2-Dichloropropane	250	U	250	15	50	NA	2/20/12 21:26		280656	
1,3-Dichlorobenzene	250	U	250	10	50	NA	2/20/12 21:26		280656	
1,4-Dichlorobenzene	250	U	250	10	50	NA	2/20/12 21:26		280656	
n-Butanol	13000	U	13000	530	50	NA	2/20/12 21:26		280656	
2-Butanone (MEK)	500	U	500	26	50	NA	2/20/12 21:26		280656	
2-Hexanone	500	U	500	18	50	NA	2/20/12 21:26		280656	
4-Methyl-2-pentanone	500	U	500	14	50	NA	2/20/12 21:26		280656	
Acetone	500	U	500	49	50	NA	2/20/12 21:26		280656	
Benzene	250	U	250	11	50	NA	2/20/12 21:26		280656	
Bromodichloromethane	250	U	250	10	50	NA	2/20/12 21:26		280656	
Bromoform	250	U	250	14	50	NA	2/20/12 21:26		280656	
Bromomethane	250	U	250	16	50	NA	2/20/12 21:26		280656	
Carbon Disulfide	24	I	500	10	50	NA	2/20/12 21:26		280656	
Carbon Tetrachloride	250	U	250	14	50	NA	2/20/12 21:26		280656	
Chlorobenzene	250	U	250	10	50	NA	2/20/12 21:26		280656	
Chloroethane	250	U	250	16	50	NA	2/20/12 21:26		280656	
Chloroform	250	U	250	11	50	NA	2/20/12 21:26		280656	
Chloromethane	250	U	250	12	50	NA	2/20/12 21:26		280656	
Cyclohexane	500	U	500	12	50	NA	2/20/12 21:26		280656	
Dibromochloromethane	250	U	250	10	50	NA	2/20/12 21:26		280656	
Dichlorodifluoromethane (CFC 12)	250	U	250	29	50	NA	2/20/12 21:26		280656	
Dichloromethane	250	U	250	11	50	NA	2/20/12 21:26		280656	
Ethylbenzene	250	U	250	10	50	NA	2/20/12 21:26		280656	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	2/20/12 21:26		280656	
Methyl Acetate	500	U	500	12	50	NA	2/20/12 21:26		280656	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Service Request: R1201031
Date Collected: 2/15/12 1150
Date Received: 2/16/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	10	50	NA	2/20/12 21:26		280656	
Methylcyclohexane	500	U	500	13	50	NA	2/20/12 21:26		280656	
Styrene	250	U	250	10	50	NA	2/20/12 21:26		280656	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	2/20/12 21:26		280656	
Toluene	250	U	250	10	50	NA	2/20/12 21:26		280656	
Trichloroethene (TCE)	250	U	250	12	50	NA	2/20/12 21:26		280656	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	2/20/12 21:26		280656	
Vinyl Chloride	14000		500	23	100	NA	2/21/12 15:46		280843	
cis-1,2-Dichloroethene	16000		500	20	100	NA	2/21/12 15:46		280843	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	2/20/12 21:26		280656	
m,p-Xylenes	250	U	250	10	50	NA	2/20/12 21:26		280656	
n-Butyl Acetate	250	U	250	11	50	NA	2/20/12 21:26		280656	
o-Xylene	250	U	250	10	50	NA	2/20/12 21:26		280656	
trans-1,2-Dichloroethene	600		250	10	50	NA	2/20/12 21:26		280656	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	2/20/12 21:26		280656	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/20/12 21:26	
Dibromofluoromethane	98	89-119	2/20/12 21:26	
Toluene-d8	100	87-121	2/20/12 21:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1150
Date Received: 2/16/12
Date Analyzed: 2/23/12 12:33

Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1475.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	10	U	10	
74-85-1	Ethene	640		10	
74-82-8	Methane	240		20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1150
Date Received: 2/16/12
Date Analyzed: 2/21/12 05:11

Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007464.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	6.8	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Service Request: R1201031
Date Collected: 2/15/12 1340
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	5.7	mg/L	1.0	10	NA	2/21/12 02:27	
Carbon, Total Organic (TOC), Average	9060A	98	mg/L	10	10	NA	2/25/12 09:51	
Iodide	300.0	3.3	mg/L	2.0	10	NA	2/28/12 18:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1340
Date Received: 2/16/12
Date Analyzed: 2/20/12 21:56

Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6400.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	5.8	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	5.0	
79-00-5	1,1,2-Trichloroethane	130	U	130	5.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	590		130	7.8	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	8.3	I	130	7.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	6.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	
106-93-4	1,2-Dibromoethane	130	U	130	5.0	
95-50-1	1,2-Dichlorobenzene	130	U	130	5.0	
107-06-2	1,2-Dichloroethane	130	U	130	5.0	
78-87-5	1,2-Dichloropropane	130	U	130	7.1	
541-73-1	1,3-Dichlorobenzene	130	U	130	5.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	5.0	
71-36-3	n-Butanol	6300	U	6300	270	
78-93-3	2-Butanone (MEK)	250	U	250	13	
591-78-6	2-Hexanone	250	U	250	8.8	
108-10-1	4-Methyl-2-pentanone	250	U	250	6.8	
67-64-1	Acetone	250	U	250	25	
71-43-2	Benzene	130	U	130	5.3	
75-27-4	Bromodichloromethane	130	U	130	5.0	
75-25-2	Bromoform	130	U	130	6.8	
74-83-9	Bromomethane	130	U	130	7.8	
75-15-0	Carbon Disulfide	10	I	250	5.0	
56-23-5	Carbon Tetrachloride	130	U	130	6.8	
108-90-7	Chlorobenzene	130	U	130	5.0	
75-00-3	Chloroethane	130	U	130	7.8	
67-66-3	Chloroform	130	U	130	5.5	
74-87-3	Chloromethane	130	U	130	6.0	
110-82-7	Cyclohexane	250	U	250	6.0	
124-48-1	Dibromochloromethane	130	U	130	5.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	15	
75-09-2	Dichloromethane	130	U	130	5.5	
100-41-4	Ethylbenzene	130	U	130	5.0	
98-82-8	Isopropylbenzene (Cumene)	130	U	130	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1340
Date Received: 2/16/12
Date Analyzed: 2/20/12 21:56

Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6400.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 25

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	250 U	250	5.8	
1634-04-4	Methyl tert-Butyl Ether	130 U	130	5.0	
108-87-2	Methylcyclohexane	250 U	250	6.3	
100-42-5	Styrene	130 U	130	5.0	
127-18-4	Tetrachloroethene (PCE)	130 U	130	5.0	
108-88-3	Toluene	130 U	130	5.0	
79-01-6	Trichloroethene (TCE)	28 I	130	5.8	
75-69-4	Trichlorofluoromethane (CFC 11)	130 U	130	5.0	
75-01-4	Vinyl Chloride	2900	130	5.8	
156-59-2	cis-1,2-Dichloroethene	3200	130	5.0	
10061-01-5	cis-1,3-Dichloropropene	130 U	130	5.0	
179601-23-1	m,p-Xylenes	130 U	130	5.0	
123-86-4	n-Butyl Acetate	130 U	130	5.3	
95-47-6	o-Xylene	130 U	130	5.0	
156-60-5	trans-1,2-Dichloroethene	51 I	130	5.0	
10061-02-6	trans-1,3-Dichloropropene	130 U	130	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/20/12 21:56	
Dibromofluoromethane	104	89-119	2/20/12 21:56	
Toluene-d8	102	87-121	2/20/12 21:56	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1340
Date Received: 2/16/12
Date Analyzed: 2/22/12 14:28

Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1455.run

Analysis Lot: 280938
Instrument Name: R-GC-02
Dilution Factor: 25

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	25 U	25	
74-85-1	Ethene	310	25	
74-82-8	Methane	1700	50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1340
Date Received: 2/16/12
Date Analyzed: 2/21/12 06:46

Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007467.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	190	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	17	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	5.0	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20120215
Lab Code: R1201031-023

Service Request: R1201031
Date Collected: 2/15/12 1427
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	3.2	mg/L	1.0	10	NA	2/21/12 02:39	
Carbon, Total Organic (TOC), Average	9060A	34.1	mg/L	4.0	4	NA	2/25/12 10:32	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 18:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1427
Date Received: 2/16/12
Date Analyzed: 2/20/12 17:50

Sample Name: LC34-BW0003E-052.5-20120215
Lab Code: R1201031-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6392.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.4		5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	2.7	I	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	4.0	I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1427
Date Received: 2/16/12
Date Analyzed: 2/20/12 17:50

Sample Name: LC34-BW0003E-052.5-20120215
Lab Code: R1201031-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6392.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	0.48 I	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	61	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	40	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	7.4	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	1.7 I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/20/12 17:50	
Dibromofluoromethane	100	89-119	2/20/12 17:50	
Toluene-d8	99	87-121	2/20/12 17:50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1427
Date Received: 2/16/12
Date Analyzed: 2/23/12 12:51

Sample Name: LC34-BW0003E-052.5-20120215
Lab Code: R1201031-023

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1476.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	6.1		5.0	
74-85-1	Ethene	310		5.0	
74-82-8	Methane	390		10	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1427
Date Received: 2/16/12
Date Analyzed: 2/22/12 02:16

Sample Name: LC34-BW0003E-052.5-20120215
Lab Code: R1201031-023

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007504.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	73	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.9	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20120215
Lab Code: R1201031-024

Service Request: R1201031
Date Collected: 2/15/12 1503
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	2.7	mg/L	1.0	10	NA	2/21/12 02:50	
Carbon, Total Organic (TOC), Average	9060A	20.0	mg/L	4.0	4	NA	2/25/12 11:12	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 18:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1503
Date Received: 2/16/12
Date Analyzed: 2/21/12 16:17

Sample Name: LC34-BW0003F-059.5-20120215
Lab Code: R1201031-024

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6423.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	0.23	I	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	1.2	I	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	13		10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	0.40	I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1503
Date Received: 2/16/12
Date Analyzed: 2/21/12 16:17

Sample Name: LC34-BW0003F-059.5-20120215
Lab Code: R1201031-024

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6423.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	190	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	0.81 I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	4.3 I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/21/12 16:17	
Dibromofluoromethane	102	89-119	2/21/12 16:17	
Toluene-d8	99	87-121	2/21/12 16:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20120215
Lab Code: R1201031-024

Service Request: R1201031
Date Collected: 2/15/12 1503
Date Received: 2/16/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	7.8		2.0	2	NA	2/23/12 13:08		281108	
Ethene	450		10	10	NA	2/23/12 13:19		281108	
Methane	570		20	10	NA	2/23/12 13:19		281108	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1503
Date Received: 2/16/12
Date Analyzed: 2/21/12 08:53

Sample Name: LC34-BW0003F-059.5-20120215
Lab Code: R1201031-024

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\022012\X0007471.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	39	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	228		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/16/12 14:50	
Carbon, Total Organic (TOC), Average	9060A	4.0		mg/L	1.0	1	NA	2/27/12 19:18	
Chloride	300.0	52.1		mg/L	2.0	10	NA	2/16/12 14:50	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 18:58	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 10:42	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/16/12 18:25	
Sulfate	300.0	44.3		mg/L	2.0	10	NA	2/17/12 10:42	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120215 Dissolved
Lab Code: R1201031-026

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	2/20/12	2/22/12 16:40	
Iron, Dissolved	6010C	100 U	µg/L	100	1	2/20/12	2/22/12 16:40	
Manganese, Dissolved	6010C	69	µg/L	10	1	2/20/12	2/22/12 16:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12
Date Analyzed: 2/21/12 16:48

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6424.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	25000		1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	50000	U	50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	670	I	2000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	1000	U	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	120	I	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	1000	U	1000	44	
74-87-3	Chloromethane	1000	U	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	I	1000	120	
75-09-2	Dichloromethane	1000	U	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12
Date Analyzed: 2/21/12 16:48

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6424.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	1000	U	1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	300	I	1000	46	
156-59-2	cis-1,2-Dichloroethene	3500		1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	1000	U	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	140	I	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/21/12 16:48	
Dibromofluoromethane	100	89-119	2/21/12 16:48	
Toluene-d8	101	87-121	2/21/12 16:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12
Date Analyzed: 2/27/12 09:42

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star040.run

Analysis Lot: 281444
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	3.8		1.0	
74-85-1	Ethene	9.2		1.0	
74-82-8	Methane	51		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1353
Date Received: 2/16/12
Date Analyzed: 2/21/12 09:56

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC05\DATA\022012\X0007473.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	3.6	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0070D-040.5-20120215
Lab Code: R1201031-027

Service Request: R1201031
Date Collected: 2/15/12 1210
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	4.1	mg/L	1.0	1	NA	2/25/12 14:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1210
Date Received: 2/16/12
Date Analyzed: 2/20/12 18:22

Sample Name: LC34-IW0070D-040.5-20120215
Lab Code: R1201031-027

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6393.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 12:10
Date Received: 2/16/12
Date Analyzed: 2/20/12 18:22

Sample Name: LC34-IW0070D-040.5-20120215
Lab Code: R1201031-027

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6393.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/20/12 18:22	
Dibromofluoromethane	102	89-119	2/20/12 18:22	
Toluene-d8	99	87-121	2/20/12 18:22	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0070D1-070.0-20120215
Lab Code: R1201031-028

Service Request: R1201031
Date Collected: 2/15/12 1138
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.1		mg/L	1.0	1	NA	2/25/12 15:17	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1138
Date Received: 2/16/12
Date Analyzed: 2/20/12 18:52

Sample Name: LC34-IW0070D1-070.0-20120215
Lab Code: R1201031-028

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6394.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1138
Date Received: 2/16/12
Date Analyzed: 2/20/12 18:52

Sample Name: LC34-IW0070D1-070.0-20120215
Lab Code: R1201031-028

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6394.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/20/12 18:52	
Dibromofluoromethane	97	89-119	2/20/12 18:52	
Toluene-d8	98	87-121	2/20/12 18:52	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Service Request: R1201031
Date Collected: 2/15/12 1058
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.4		mg/L	1.0	1	NA	2/25/12 15:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1058
Date Received: 2/16/12
Date Analyzed: 2/20/12 19:23

Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6395.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1058
Date Received: 2/16/12
Date Analyzed: 2/20/12 19:23

Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6395.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	2/20/12 19:23	
Dibromofluoromethane	102	89-119	2/20/12 19:23	
Toluene-d8	100	87-121	2/20/12 19:23	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120215
Lab Code: R1201031-030

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	1.9	mg/L	1.0	10	NA	2/21/12 03:02	
Carbon, Total Organic (TOC), Average	9060A	7.3	mg/L	1.0	1	NA	2/25/12 16:38	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 20:00	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120215 Dissolved
Lab Code: R1201031-031

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 16:45	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 16:45	
Manganese, Dissolved	6010C	14		µg/L	10	1	2/20/12	2/22/12 16:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12
Date Analyzed: 2/20/12 19:54

Sample Name: LC34-IW0076-075.0-20120215
Lab Code: R1201031-030

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6396.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	150		5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	0.94	I	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12
Date Analyzed: 2/20/12 19:54

Sample Name: LC34-IW0076-075.0-20120215
Lab Code: R1201031-030

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6396.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	0.75	I	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	8.4		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	180		5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	8.1		5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/20/12 19:54	
Dibromofluoromethane	101	89-119	2/20/12 19:54	
Toluene-d8	102	87-121	2/20/12 19:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12
Date Analyzed: 2/27/12 09:52

Sample Name: LC34-IW0076-075.0-20120215
Lab Code: R1201031-030

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star041.run

Analysis Lot: 281444
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	10	U	10	
74-85-1	Ethene	10	U	10	
74-82-8	Methane	780		20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12 1453
Date Received: 2/16/12
Date Analyzed: 2/21/12 10:59

Sample Name: LC34-IW0076-075.0-20120215
Lab Code: R1201031-030

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007475.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	2.8	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	3.3	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120215-01
Lab Code: R1201031-032

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	96		1.0	1	NA	2/27/12 10:01		281444	
Ethene	150		5.0	5	NA	2/27/12 10:12		281444	
Methane	410		10	5	NA	2/27/12 10:12		281444	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120215-02
Lab Code: R1201031-033

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	310		mg/L	2.0	1	NA	2/24/12 16:18	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/21/12 12:34

Sample Name: LC34-FD-20120215-03
Lab Code: R1201031-034

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007478.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	3.7		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/14-16/12/ TR0272A
 Sample Matrix: Water

Service Request: R1201031
 Date Collected: 2/15/12
 Date Received: 2/16/12
 Date Analyzed: 2/20/12 15:48

Sample Name: LC34-TB-20120215-01
 Lab Code: R1201031-035

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\msvoa12\Data\022012\U6388.D\

Analysis Lot: 280656
 Instrument Name: R-MS-12
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 15:48

Sample Name: LC34-TB-20120215-01
Lab Code: R1201031-035

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6388.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/20/12 15:48	
Dibromofluoromethane	100	89-119	2/20/12 15:48	
Toluene-d8	102	87-121	2/20/12 15:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 16:19

Sample Name: LC34-TB-20120215-02
Lab Code: R1201031-036

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6389.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 16:19

Sample Name: LC34-TB-20120215-02
Lab Code: R1201031-036

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6389.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/20/12 16:19	
Dibromofluoromethane	98	89-119	2/20/12 16:19	
Toluene-d8	99	87-121	2/20/12 16:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 16:49

Sample Name: LC34-TB-20120215-03
Lab Code: R1201031-037

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6390.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 16:49

Sample Name: LC34-TB-20120215-03
Lab Code: R1201031-037

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6390.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/20/12 16:49	
Dibromofluoromethane	99	89-119	2/20/12 16:49	
Toluene-d8	98	87-121	2/20/12 16:49	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	241		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 16:51	
Carbon, Total Organic (TOC), Average	9060A	2.8		mg/L	1.0	1	NA	2/25/12 17:19	
Chloride	300.0	65.8		mg/L	2.0	10	NA	2/17/12 16:51	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 19:29	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 16:51	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:21	
Sulfate	300.0	56.0		mg/L	2.0	10	NA	2/17/12 16:51	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120216 Dissolved
Lab Code: R1201031-039

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 16:52	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 16:52	
Manganese, Dissolved	6010C	18		µg/L	10	1	2/20/12	2/22/12 16:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12
Date Analyzed: 2/21/12 17:18

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoal2\Data\022112\U6425.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	120	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	100	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	120	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	93000		2500	160	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	130	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	
106-93-4	1,2-Dibromoethane	2500	U	2500	100	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	100	
107-06-2	1,2-Dichloroethane	2500	U	2500	100	
78-87-5	1,2-Dichloropropane	2500	U	2500	140	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	100	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	100	
71-36-3	n-Butanol	130000	U	130000	5300	
78-93-3	2-Butanone (MEK)	5000	U	5000	260	
591-78-6	2-Hexanone	5000	U	5000	180	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	140	
67-64-1	Acetone	2700	I	5000	490	
71-43-2	Benzene	2500	U	2500	110	
75-27-4	Bromodichloromethane	2500	U	2500	100	
75-25-2	Bromoform	2500	U	2500	140	
74-83-9	Bromomethane	2500	U	2500	160	
75-15-0	Carbon Disulfide	140	I	5000	100	
56-23-5	Carbon Tetrachloride	2500	U	2500	140	
108-90-7	Chlorobenzene	2500	U	2500	100	
75-00-3	Chloroethane	2500	U	2500	160	
67-66-3	Chloroform	2500	U	2500	110	
74-87-3	Chloromethane	2500	U	2500	120	
110-82-7	Cyclohexane	5000	U	5000	120	
124-48-1	Dibromochloromethane	2500	U	2500	100	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	
75-09-2	Dichloromethane	2500	U	2500	110	
100-41-4	Ethylbenzene	2500	U	2500	100	
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	100	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12
Date Analyzed: 2/21/12 17:18

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6425.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	5000	U	5000	120	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	100	
108-87-2	Methylcyclohexane	5000	U	5000	130	
100-42-5	Styrene	2500	U	2500	100	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	100	
108-88-3	Toluene	2500	U	2500	100	
79-01-6	Trichloroethene (TCE)	2500	U	2500	120	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	100	
75-01-4	Vinyl Chloride	840	I	2500	120	
156-59-2	cis-1,2-Dichloroethene	11000		2500	100	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	100	
179601-23-1	m,p-Xylenes	2500	U	2500	100	
123-86-4	n-Butyl Acetate	2500	U	2500	110	
95-47-6	o-Xylene	2500	U	2500	100	
156-60-5	trans-1,2-Dichloroethene	290	I	2500	100	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	100	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/21/12 17:18	
Dibromofluoromethane	102	89-119	2/21/12 17:18	
Toluene-d8	100	87-121	2/21/12 17:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12
Date Analyzed: 2/27/12 10:22

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star044.run

Analysis Lot: 281444
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	3.0		1.0	
74-85-1	Ethene	26		1.0	
74-82-8	Methane	64		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0839
Date Received: 2/17/12
Date Analyzed: 2/21/12 13:37

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007480.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	1.6		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20120216
Lab Code: R1201031-040

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	328		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	3.2		mg/L	2.0	20	NA	2/20/12 22:26	
Carbon, Total Organic (TOC), Average	9060A	32.0		mg/L	4.0	4	NA	2/27/12 19:59	
Chloride	300.0	95.8		mg/L	4.0	20	NA	2/20/12 22:26	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 19:37	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 17:39	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:23	
Sulfate	300.0	31.5		mg/L	2.0	10	NA	2/17/12 17:39	
Sulfide, Total	SM 4500-S2- F	3.4		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20120216 Dissolved
Lab Code: R1201031-041

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 17:08	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 17:08	
Manganese, Dissolved	6010C	17		µg/L	10	1	2/20/12	2/22/12 17:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12
Date Analyzed: 2/21/12 17:49

Sample Name: LC34-BW0001B-031.5-20120216
Lab Code: R1201031-040

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6426.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	150000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	250000	U	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	4200	I	10000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12
Date Analyzed: 2/21/12 17:49

Sample Name: LC34-BW0001B-031.5-20120216
Lab Code: R1201031-040

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\022112\U6426.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	1400	I	5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	2200	I	5000	230	
156-59-2	cis-1,2-Dichloroethene	38000		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	5000	U	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	920	I	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/21/12 17:49	
Dibromofluoromethane	101	89-119	2/21/12 17:49	
Toluene-d8	100	87-121	2/21/12 17:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12
Date Analyzed: 2/27/12 14:04

Sample Name: LC34-BW0001B-031.5-20120216
Lab Code: R1201031-040

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star057.run

Analysis Lot: 281444
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	16		1.0	
74-85-1	Ethene	30		1.0	
74-82-8	Methane	83		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 0924
Date Received: 2/17/12
Date Analyzed: 2/21/12 14:40

Sample Name: LC34-BW0001B-031.5-20120216
Lab Code: R1201031-040

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007482.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	47	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	17	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120216
Lab Code: R1201031-042

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	760		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	29.3		mg/L	1.0	10	NA	2/17/12 17:55	
Carbon, Total Organic (TOC), Average	9060A	504		mg/L	40	40	NA	2/27/12 22:01	
Chloride	300.0	247		mg/L	10	50	NA	2/21/12 05:40	
Iodide	300.0	40.7		mg/L	2.0	10	NA	2/28/12 19:44	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 17:55	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:24	
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	2/17/12 17:55	
Sulfide, Total	SM 4500-S2- F	5.8		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120216 Dissolved
Lab Code: R1201031-043

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 17:35	
Iron, Dissolved	6010C	140		µg/L	100	1	2/20/12	2/22/12 17:35	
Manganese, Dissolved	6010C	57		µg/L	10	1	2/20/12	2/22/12 17:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120216
Lab Code: R1201031-042

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	2/22/12 15:20		281034	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	2/22/12 15:20		281034	
1,1,2-Trichloro-1,2,2-trifluoroethane	45000		2500	160	500	NA	2/21/12 18:20		280843	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	2/22/12 15:20		281034	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	2/22/12 15:20		281034	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	2/22/12 15:20		281034	
1,2-Dibromoethane	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,2-Dichloroethane	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,2-Dichloropropane	1300	U	1300	70	250	NA	2/22/12 15:20		281034	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
n-Butanol	63000	U	63000	2700	250	NA	2/22/12 15:20		281034	
2-Butanone (MEK)	2500	U	2500	130	250	NA	2/22/12 15:20		281034	
2-Hexanone	2500	U	2500	88	250	NA	2/22/12 15:20		281034	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	2/22/12 15:20		281034	
Acetone	2500	U	2500	250	250	NA	2/22/12 15:20		281034	
Benzene	1300	U	1300	53	250	NA	2/22/12 15:20		281034	
Bromodichloromethane	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Bromoform	1300	U	1300	68	250	NA	2/22/12 15:20		281034	
Bromomethane	1300	U	1300	78	250	NA	2/22/12 15:20		281034	
Carbon Disulfide	2500	U	2500	50	250	NA	2/22/12 15:20		281034	
Carbon Tetrachloride	1300	U	1300	68	250	NA	2/22/12 15:20		281034	
Chlorobenzene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Chloroethane	1300	U	1300	78	250	NA	2/22/12 15:20		281034	
Chloroform	1300	U	1300	55	250	NA	2/22/12 15:20		281034	
Chloromethane	1300	U	1300	60	250	NA	2/22/12 15:20		281034	
Cyclohexane	2500	U	2500	60	250	NA	2/22/12 15:20		281034	
Dibromochloromethane	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	2/22/12 15:20		281034	
Dichloromethane	1300	U	1300	55	250	NA	2/22/12 15:20		281034	
Ethylbenzene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Methyl Acetate	2500	U	2500	58	250	NA	2/22/12 15:20		281034	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120216
Lab Code: R1201031-042

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Methylcyclohexane	2500	U	2500	63	250	NA	2/22/12 15:20		281034	
Styrene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Toluene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Trichloroethene (TCE)	1400		1300	58	250	NA	2/22/12 15:20		281034	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
Vinyl Chloride	3700		1300	58	250	NA	2/22/12 15:20		281034	
cis-1,2-Dichloroethene	26000		1300	50	250	NA	2/22/12 15:20		281034	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
m,p-Xylenes	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
n-Butyl Acetate	1300	U	1300	53	250	NA	2/22/12 15:20		281034	
o-Xylene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	
trans-1,2-Dichloroethene	390	I	1300	50	250	NA	2/22/12 15:20		281034	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	2/22/12 15:20		281034	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/22/12 15:20	
Dibromofluoromethane	104	89-119	2/22/12 15:20	
Toluene-d8	102	87-121	2/22/12 15:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120216
Lab Code: R1201031-042

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	59		1.0	1	NA	2/27/12 14:14		281444	
Ethene	53		1.0	1	NA	2/27/12 14:14		281444	
Methane	600		20	10	NA	2/27/12 14:26		281444	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1005
Date Received: 2/17/12
Date Analyzed: 2/22/12 03:19

Sample Name: LC34-BW0001C-038.5-20120216
Lab Code: R1201031-042

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007506.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	2.5 U	2.5	
64-19-7	Acetic Acid	390	5.0	
107-92-6	Butanoic Acid (Butyric Acid)	440	10	
50-21-5	Lactic Acid	5.0 U	5.0	
79-09-4	Propionic Acid	13	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20120216
Lab Code: R1201031-044

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	465		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	8.9		mg/L	1.0	10	NA	2/17/12 18:10	
Carbon, Total Organic (TOC), Average	9060A	176		mg/L	20	20	NA	2/27/12 22:42	
Chloride	300.0	751		mg/L	20	100	NA	2/21/12 14:20	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 19:52	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 18:10	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:25	
Sulfate	300.0	16.3		mg/L	2.0	10	NA	2/17/12 18:10	
Sulfide, Total	SM 4500-S2- F	15.5		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20120216 Dissolved
Lab Code: R1201031-045

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	2/20/12	2/22/12 17:40	
Iron, Dissolved	6010C	100 U	µg/L	100	1	2/20/12	2/22/12 17:40	
Manganese, Dissolved	6010C	47	µg/L	10	1	2/20/12	2/22/12 17:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12
Date Analyzed: 2/22/12 15:50

Sample Name: LC34-BW0001D-045.5-20120216
Lab Code: R1201031-044

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022212\D8459.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	69000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	36000	I	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	10000	U	10000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12
Date Analyzed: 2/22/12 15:50

Sample Name: LC34-BW0001D-045.5-20120216
Lab Code: R1201031-044

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022212\D8459.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	110000		5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	5000	U	5000	230	
156-59-2	cis-1,2-Dichloroethene	5100		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	5000	U	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/22/12 15:50	
Dibromofluoromethane	104	89-119	2/22/12 15:50	
Toluene-d8	103	87-121	2/22/12 15:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12
Date Analyzed: 2/28/12 10:01

Sample Name: LC34-BW0001D-045.5-20120216
Lab Code: R1201031-044

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star731.run

Analysis Lot: 281606
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	100		2.0	
74-85-1	Ethene	4.6		2.0	
74-82-8	Methane	27		4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1211
Date Received: 2/17/12
Date Analyzed: 2/22/12 13:42

Sample Name: LC34-BW0001D-045.5-20120216
Lab Code: R1201031-044

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQDATA\HPLC05\DATA\022012\X0007509.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	200	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	140	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120216
Lab Code: R1201031-046

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	239		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	2.9		mg/L	1.0	10	NA	2/17/12 17:59	
Carbon, Total Organic (TOC), Average	9060A	10.7		mg/L	1.0	1	NA	3/1/12 14:04	
Chloride	300.0	603		mg/L	20	100	NA	2/20/12 14:55	
Iodide	300.0	2.0	U	mg/L	2.0	10	NA	2/28/12 20:08	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 17:59	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:25	
Sulfate	300.0	25.4		mg/L	2.0	10	NA	2/17/12 17:59	
Sulfide, Total	SM 4500-S2- F	8.9		mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120216 Dissolved
Lab Code: R1201031-047

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 17:46	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 17:46	
Manganese, Dissolved	6010C	13		µg/L	10	1	2/20/12	2/22/12 17:46	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12
Date Analyzed: 2/22/12 14:21

Sample Name: LC34-BW0001E-052.5-20120216
Lab Code: R1201031-046

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022212\D8456.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	1.9	I	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	1.6	I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12
Date Analyzed: 2/22/12 14:21

Sample Name: LC34-BW0001E-052.5-20120216
Lab Code: R1201031-046

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022212\D8456.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	1.2	I	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	27		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	2.5	I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	1.0	I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	2/22/12 14:21	
Dibromofluoromethane	103	89-119	2/22/12 14:21	
Toluene-d8	103	87-121	2/22/12 14:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120216
Lab Code: R1201031-046

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	3.7		2.0	2	NA	2/28/12 10:15		281606	
Ethene	110		2.0	2	NA	2/28/12 10:15		281606	
Methane	620		20	10	NA	2/28/12 10:25		281606	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1136
Date Received: 2/17/12
Date Analyzed: 2/21/12 19:25

Sample Name: LC34-BW0001E-052.5-20120216
Lab Code: R1201031-046

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007491.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
127-17-3	Pyruvic Acid	0.50	U	0.50	
64-19-7	Acetic Acid	17		1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0	U	2.0	
50-21-5	Lactic Acid	1.0	U	1.0	
79-09-4	Propionic Acid	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20120216
Lab Code: R1201031-048

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	250	mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	3.0	mg/L	1.0	10	NA	2/17/12 18:10	
Carbon, Total Organic (TOC), Average	9060A	16.8	mg/L	1.0	1	NA	2/28/12 00:04	
Chloride	300.0	619	mg/L	20	100	NA	2/20/12 15:09	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 20:15	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	2/17/12 18:10	
Nitrite as Nitrogen	353.2	0.010 U	mg/L	0.010	1	NA	2/17/12 12:26	
Sulfate	300.0	37.4	mg/L	2.0	10	NA	2/17/12 18:10	
Sulfide, Total	SM 4500-S2- F	6.7	mg/L	1.0	1	NA	2/17/12 19:00	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20120216 Dissolved
Lab Code: R1201031-049

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 17:53	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 17:53	
Manganese, Dissolved	6010C	12		µg/L	10	1	2/20/12	2/22/12 17:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12
Date Analyzed: 2/21/12 19:52

Sample Name: LC34-BW0001F-059.5-20120216
Lab Code: R1201031-048

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6430.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.3 I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	1.4 I	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.69 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12
Date Analyzed: 2/21/12 19:52

Sample Name: LC34-BW0001F-059.5-20120216
Lab Code: R1201031-048

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6430.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.1		5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	81		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	53		5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	2/21/12 19:52	
Dibromofluoromethane	101	89-119	2/21/12 19:52	
Toluene-d8	100	87-121	2/21/12 19:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20120216
Lab Code: R1201031-048

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	1.8		1.0	1	NA	2/28/12 10:38		281606	
Ethene	58		1.0	1	NA	2/28/12 10:38		281606	
Methane	270		10	5	NA	2/28/12 10:48		281606	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1103
Date Received: 2/17/12
Date Analyzed: 2/21/12 20:28

Sample Name: LC34-BW0001F-059.5-20120216
Lab Code: R1201031-048

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\022012\X0007493.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	32	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120216
Lab Code: R1201031-050

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	420		mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	10.8		mg/L	1.0	10	NA	2/17/12 18:22	
Carbon, Total Organic (TOC), Average	9060A	124		mg/L	10	10	NA	3/1/12 14:45	
Chloride	300.0	96.6		mg/L	4.0	20	NA	2/20/12 15:23	
Iodide	300.0	10.8		mg/L	2.0	10	NA	2/28/12 20:23	
Nitrate as Nitrogen	300.0	1.0	U	mg/L	1.0	10	NA	2/17/12 18:22	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:27	
Sulfate	300.0	2.0	U	mg/L	2.0	10	NA	2/17/12 18:22	
Sulfide, Total	SM 4500-S2- F	7.6		mg/L	1.1	1	NA	2/17/12 19:00	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120216 Dissolved
Lab Code: R1201031-051

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 17:59	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 17:59	
Manganese, Dissolved	6010C	57		µg/L	10	1	2/20/12	2/22/12 17:59	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12
Date Analyzed: 2/23/12 11:53

Sample Name: LC34-IW0002D-037.5-20120216
Lab Code: R1201031-050

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022312\U6495.D\

Analysis Lot: 281208
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	450	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250 U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	19	
106-93-4	1,2-Dibromoethane	250 U	250	10	
95-50-1	1,2-Dichlorobenzene	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	15	
541-73-1	1,3-Dichlorobenzene	250 U	250	10	
106-46-7	1,4-Dichlorobenzene	250 U	250	10	
71-36-3	n-Butanol	13000 U	13000	530	
78-93-3	2-Butanone (MEK)	500 U	500	26	
591-78-6	2-Hexanone	500 U	500	18	
108-10-1	4-Methyl-2-pentanone	500 U	500	14	
67-64-1	Acetone	500 U	500	49	
71-43-2	Benzene	250 U	250	11	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	14	
74-83-9	Bromomethane	250 U	250	16	
75-15-0	Carbon Disulfide	500 U	500	10	
56-23-5	Carbon Tetrachloride	250 U	250	14	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	16	
67-66-3	Chloroform	250 U	250	11	
74-87-3	Chloromethane	250 U	250	12	
110-82-7	Cyclohexane	500 U	500	12	
124-48-1	Dibromochloromethane	250 U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250 U	250	29	
75-09-2	Dichloromethane	250 U	250	11	
100-41-4	Ethylbenzene	250 U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250 U	250	10	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12
Date Analyzed: 2/23/12 11:53

Sample Name: LC34-IW0002D-037.5-20120216
Lab Code: R1201031-050

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022312\U6495.D\

Analysis Lot: 281208
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	26	I	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	9400		250	12	
156-59-2	cis-1,2-Dichloroethene	4700		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	250	U	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	300		250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	2/23/12 11:53	
Dibromofluoromethane	101	89-119	2/23/12 11:53	
Toluene-d8	98	87-121	2/23/12 11:53	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120216
Lab Code: R1201031-050

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	13		4.0	4	NA	2/28/12 11:01		281606	
Ethene	44		4.0	4	NA	2/28/12 11:01		281606	
Methane	660		20	10	NA	2/28/12 11:25		281606	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1419
Date Received: 2/17/12
Date Analyzed: 2/22/12 14:45

Sample Name: LC34-IW0002D-037.5-20120216
Lab Code: R1201031-050

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007511.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	1.0 U	1.0	
64-19-7	Acetic Acid	230	2.0	
107-92-6	Butanoic Acid (Butyric Acid)	38	4.0	
50-21-5	Lactic Acid	2.0 U	2.0	
79-09-4	Propionic Acid	7.7	2.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	301	mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	4.7	mg/L	1.0	10	NA	2/17/12 18:33	
Carbon, Total Organic (TOC), Average	9060A	57.6	mg/L	4.0	4	NA	2/28/12 02:47	
Chloride	300.0	572	mg/L	20	100	NA	2/20/12 16:19	
Iodide	300.0	2.2	mg/L	2.0	10	NA	2/28/12 20:31	
Nitrate as Nitrogen	300.0	1.0 U	mg/L	1.0	10	NA	2/17/12 18:33	
Nitrite as Nitrogen	353.2	0.010 U	mg/L	0.010	1	NA	2/17/12 12:29	
Sulfate	300.0	5.1	mg/L	2.0	10	NA	2/17/12 18:33	
Sulfide, Total	SM 4500-S2- F	14.4	mg/L	1.0	1	NA	2/17/12 19:00	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120216 Dissolved
Lab Code: R1201031-053

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	2/20/12	2/22/12 18:15	
Iron, Dissolved	6010C	100 U	µg/L	100	1	2/20/12	2/22/12 18:15	
Manganese, Dissolved	6010C	14	µg/L	10	1	2/20/12	2/22/12 18:15	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	2/21/12 20:23		280843	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	2/21/12 20:23		280843	
1,1,2-Trichloro-1,2,2-trifluoroethane	47		5.0	0.31	1	NA	2/21/12 20:23		280843	
1,1-Dichloroethane (1,1-DCA)	0.69	I	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,1-Dichloroethene (1,1-DCE)	0.99	I	5.0	0.29	1	NA	2/21/12 20:23		280843	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	2/21/12 20:23		280843	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	2/21/12 20:23		280843	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	2/21/12 20:23		280843	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
n-Butanol	250	U	250	11	1	NA	2/21/12 20:23		280843	
2-Butanone (MEK)	10	U	10	0.51	1	NA	2/21/12 20:23		280843	
2-Hexanone	10	U	10	0.35	1	NA	2/21/12 20:23		280843	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	2/21/12 20:23		280843	
Acetone	10	U	10	0.98	1	NA	2/21/12 20:23		280843	
Benzene	5.0	U	5.0	0.21	1	NA	2/21/12 20:23		280843	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Bromoform	5.0	U	5.0	0.27	1	NA	2/21/12 20:23		280843	
Bromomethane	5.0	U	5.0	0.31	1	NA	2/21/12 20:23		280843	
Carbon Disulfide	0.68	I	10	0.20	1	NA	2/21/12 20:23		280843	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	2/21/12 20:23		280843	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Chloroethane	5.0	U	5.0	0.31	1	NA	2/21/12 20:23		280843	
Chloroform	5.0	U	5.0	0.22	1	NA	2/21/12 20:23		280843	
Chloromethane	5.0	U	5.0	0.24	1	NA	2/21/12 20:23		280843	
Cyclohexane	10	U	10	0.24	1	NA	2/21/12 20:23		280843	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Dichlorodifluoromethane (CFC 12)	18		5.0	0.56	1	NA	2/21/12 20:23		280843	
Dichloromethane	5.0	U	5.0	0.22	1	NA	2/21/12 20:23		280843	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Methyl Acetate	10	U	10	0.23	1	NA	2/21/12 20:23		280843	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Methylcyclohexane	10	U	10	0.25	1	NA	2/21/12 20:23		280843	
Styrene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Toluene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Trichloroethene (TCE)	4.1	I	5.0	0.23	1	NA	2/21/12 20:23		280843	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
Vinyl Chloride	2000		130	5.8	25	NA	2/22/12 16:50		281034	
cis-1,2-Dichloroethene	250		130	5.0	25	NA	2/22/12 16:50		281034	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	2/21/12 20:23		280843	
o-Xylene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	
trans-1,2-Dichloroethene	35		5.0	0.20	1	NA	2/21/12 20:23		280843	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	2/21/12 20:23		280843	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	2/21/12 20:23	
Dibromofluoromethane	102	89-119	2/21/12 20:23	
Toluene-d8	100	87-121	2/21/12 20:23	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12
Date Analyzed: 2/28/12 11:56

Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star739.run

Analysis Lot: 281606
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	7.6		5.0	
74-85-1	Ethene	370		5.0	
74-82-8	Methane	240		10	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12 1333
Date Received: 2/17/12
Date Analyzed: 2/21/12 22:34

Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUATA\HPLC05\DATA\022012\X0007497.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	110	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	9.9	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.5	1.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120216-01
Lab Code: R1201031-054

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.0		mg/L	1.0	1	NA	2/28/12 03:28	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120216-02
Lab Code: R1201031-055

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Sulfide, Total	SM 4500-S2- F	3.2	mg/L	1.0	1	NA	2/17/12 19:00	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: LC34-FD-20120216-03
Lab Code: R1201031-056

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	36.6	mg/L	1.0	10	NA	2/21/12 03:13	
Iodide	300.0	2.0 U	mg/L	2.0	10	NA	2/28/12 20:54	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12 22:06

Sample Name: LC34-IDW-185539-20120216
Lab Code: R1201031-057

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022112\D8441.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	37 I	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50 U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	300	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	50 U	50	3.1	
75-15-0	Carbon Disulfide	100 U	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	50 U	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	
98-82-8	Isopropylbenzene (Cumene)	50 U	50	2.0	

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Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12 22:06

Sample Name: LC34-IDW-185539-20120216
Lab Code: R1201031-057

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022112\D8441.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	17	I	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	300		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1400		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	14	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	2/21/12 22:06	
Dibromofluoromethane	105	89-119	2/21/12 22:06	
Toluene-d8	103	87-121	2/21/12 22:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12 13:12

Sample Name: LC34-TB-20120216-01
Lab Code: R1201031-058

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6417.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12 13:12

Sample Name: LC34-TB-20120216-01
Lab Code: R1201031-058

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6417.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	2/21/12 13:12	
Dibromofluoromethane	97	89-119	2/21/12 13:12	
Toluene-d8	99	87-121	2/21/12 13:12	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB1

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO3, Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	2/16/12 13:53	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	2/15/12 17:36	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	2/22/12 21:06	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	2/15/12 17:36	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	2/28/12 16:04	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	2/15/12 17:36	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/15/12 20:05	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	2/15/12 17:36	
Sulfide, Total	SM 4500-S2- F	1.0	U	mg/L	1.0	1	NA	2/17/12 19:00	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB2

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	U	mg/L	2.0	1	NA	2/24/12 16:18	
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	2/16/12 10:34	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	2/24/12 20:15	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	2/16/12 10:34	
Iodide	300.0	0.20	U	mg/L	0.20	1	NA	2/28/12 19:13	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	2/16/12 10:34	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/16/12 18:21	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	2/16/12 10:34	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB3

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	2/17/12 10:01	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	2/25/12 12:34	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	2/17/12 10:01	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	2/17/12 10:01	
Nitrite as Nitrogen	353.2	0.010	U	mg/L	0.010	1	NA	2/17/12 12:19	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	2/17/12 10:01	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB4

Service Request: R1201031
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	2/17/12 14:55	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	2/27/12 17:57	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	2/17/12 14:55	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	2/17/12 09:56	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	2/17/12 09:56	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB5

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10	U	mg/L	0.10	1	NA	2/20/12 18:41	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	3/1/12 12:43	
Chloride	300.0	0.20	U	mg/L	0.20	1	NA	2/20/12 10:13	
Nitrate as Nitrogen	300.0	0.10	U	mg/L	0.10	1	NA	2/17/12 14:55	
Sulfate	300.0	0.20	U	mg/L	0.20	1	NA	2/17/12 14:55	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB6

Service Request: R1201031
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Bromide	300.0	0.10 U	mg/L	0.10	1	NA	2/20/12 23:23	
Chloride	300.0	0.20 U	mg/L	0.20	1	NA	2/20/12 18:41	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB7

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	0.20 U	mg/L	0.20	1	NA	2/21/12 00:52	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB8

Service Request: R1201031
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Chloride	300.0	0.20 U	mg/L	0.20	1	NA	2/21/12 09:49	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB1

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 19:38	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/16/12	2/20/12 19:38	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 19:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB2

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 19:44	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/16/12	2/20/12 19:44	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	2/16/12	2/20/12 19:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB3

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 16:23	
Iron, Dissolved	6010C	100	U	µg/L	100	1	2/20/12	2/22/12 16:23	
Manganese, Dissolved	6010C	10	U	µg/L	10	1	2/20/12	2/22/12 16:23	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1201031-MB4

Service Request: R1201031
Date Collected: NA
Date Received: NA

Basis: NA

Inorganic Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Arsenic, Dissolved	6010C	10 U	µg/L	10	1	2/20/12	2/22/12 16:28	
Iron, Dissolved	6010C	100 U	µg/L	100	1	2/20/12	2/22/12 16:28	
Manganese, Dissolved	6010C	10 U	µg/L	10	1	2/20/12	2/22/12 16:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/17/12 11:25

Sample Name: Method Blank
Lab Code: RQ1201955-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8367.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/17/12 11:25

Sample Name: Method Blank
Lab Code: RQ1201955-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\021712\D8367.D\

Analysis Lot: 280472
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	2/17/12 11:25	
Dibromofluoromethane	102	89-119	2/17/12 11:25	
Toluene-d8	98	87-121	2/17/12 11:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 2/14-16/12/ TR0272A
 Sample Matrix: Water

Service Request: R1201031
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 2/20/12 13:59

Sample Name: Method Blank
 Lab Code: RQ1201851-01

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\msv0a10\data\022012\D8394.D\

Analysis Lot: 280661
 Instrument Name: R-MS-10
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/20/12 13:59

Sample Name: Method Blank
Lab Code: RQ1201851-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022012\D8394.D\

Analysis Lot: 280661
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	2/20/12 13:59	
Dibromofluoromethane	106	89-119	2/20/12 13:59	
Toluene-d8	104	87-121	2/20/12 13:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/20/12 14:47

Sample Name: Method Blank
Lab Code: RQ1201822-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6386.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/20/12 14:47

Sample Name: Method Blank
Lab Code: RQ1201822-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022012\U6386.D\

Analysis Lot: 280656
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/20/12 14:47	
Dibromofluoromethane	98	89-119	2/20/12 14:47	
Toluene-d8	99	87-121	2/20/12 14:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/21/12 12:40

Sample Name: Method Blank
Lab Code: RQ1202134-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6416.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/21/12 12:40

Sample Name: Method Blank
Lab Code: RQ1202134-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022112\U6416.D\

Analysis Lot: 280843
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	2/21/12 12:40	
Dibromofluoromethane	99	89-119	2/21/12 12:40	
Toluene-d8	98	87-121	2/21/12 12:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/21/12 14:38

Sample Name: Method Blank
Lab Code: RQ1201947-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoal0\data\022112\D8426.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/21/12 14:38

Sample Name: Method Blank
Lab Code: RQ1201947-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022112\D8426.D\

Analysis Lot: 280878
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/21/12 14:38	
Dibromofluoromethane	105	89-119	2/21/12 14:38	
Toluene-d8	103	87-121	2/21/12 14:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/22/12 13:51

Sample Name: Method Blank
Lab Code: RQ1201994-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\022212\D8455.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/22/12 13:51

Sample Name: Method Blank
Lab Code: RQ1201994-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa10\data\022212\D8455.D\

Analysis Lot: 281034
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	2/22/12 13:51	
Dibromofluoromethane	104	89-119	2/22/12 13:51	
Toluene-d8	101	87-121	2/22/12 13:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/23/12 11:22

Sample Name: Method Blank
Lab Code: RQ1202074-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022312\U6494.D\

Analysis Lot: 281208
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.36	I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/23/12 11:22

Sample Name: Method Blank
Lab Code: RQ1202074-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\022312\U6494.D\

Analysis Lot: 281208
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	2/23/12 11:22	
Dibromofluoromethane	100	89-119	2/23/12 11:22	
Toluene-d8	98	87-121	2/23/12 11:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/22/12 09:42

Sample Name: Method Blank
Lab Code: RQ1201868-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1435.run

Analysis Lot: 280938
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	2.0	U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/23/12 09:19

Sample Name: Method Blank
Lab Code: RQ1201921-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star1458.run

Analysis Lot: 281108
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/27/12 09:07

Sample Name: Method Blank
Lab Code: RQ1202015-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star016.run

Analysis Lot: 281444
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	2.0	U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/28/12 09:41

Sample Name: Method Blank
Lab Code: RQ1202058-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star729.run

Analysis Lot: 281606
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/20/12 13:32

Sample Name: Method Blank
Lab Code: RQ1201891-01

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQUDATA\HPLC05\DATA\022012\X0007435.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: NA
Date Received: NA
Date Analyzed: 2/21/12 16:15

Sample Name: Method Blank
Lab Code: RQ1201891-06

Units: mg/L
Basis: NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids
Data File Name: J:\ACQU\DATA\HPLC05\DATA\022012\X0007485.D\

Analysis Lot: 281004
Instrument Name: R-HPLC-05
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
127-17-3	Pyruvic Acid	0.50 U	0.50	
64-19-7	Acetic Acid	1.0 U	1.0	
107-92-6	Butanoic Acid (Butyric Acid)	2.0 U	2.0	
50-21-5	Lactic Acid	1.0 U	1.0	
79-09-4	Propionic Acid	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/25/12

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Units: mg/L
Basis: NA

LC34-BW0002B-031.
 5-20120215DUP

Duplicate Sample
 R1201031-018DUP3

Analyte Name	Method	LOQ	Sample Result	Duplicate Sample Result	Average	RPD	RPD Limit
Carbon, Total Organic (TOC), Average	9060A	1.0	11.4	11.4	11.4	<1	20

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/25/12

Matrix Spike Summary
General Chemistry Parameters

Sample Name: LC34-BW0002B-031.5-20120215
Lab Code: R1201031-018

Units: mg/L
Basis: NA

Analytical Method: 9060A

LC34-BW0002B-031.5-201202
15MS
Matrix Spike
R1201031-018MS5

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	11.4	20.8	10.0	95	62 - 135

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/21/12 - 2/28/12

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0003B-031.5-20120215
Lab Code: R1201031-020

Units: mg/L
Basis: NA

Analytical Method: 300.0

Analyte Name	Sample Result	LC34-BW0003B-031.5-20120215 15MS Matrix Spike R1201031-020MS6			LC34-BW0003B-031.5-20120215 15DMS Duplicate Matrix Spike R1201031-020DMS6			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Bromide	ND	10.2	10.0	102	10.2	10.0	102	90 - 110	<1	20
Iodide	ND	10.2	10.0	102	10.1	10.0	101	90 - 110	<1	20

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/16/12 -
 2/17/12

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Units: mg/L
Basis: NA

LC34-BW0003C-038.
 5-20120215DUP
Duplicate Sample

Analyte Name	Method	LOQ	Sample Result	Duplicate Sample		RPD	RPD Limit
				R1201031-021DUP4	Average		
Nitrite as Nitrogen	353.2	0.010	0.010 U	0.010 U	NC	NC	20
Sulfide, Total	SM 4500-S2- F	1.0	4.2	4.1	4.15	3	20

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/16/12

Matrix Spike Summary
General Chemistry Parameters

Sample Name: LC34-BW0003C-038.5-20120215
Lab Code: R1201031-021

Units: mg/L
Basis: NA

Analytical Method: 353.2

LC34-BW0003C-038.5-201202

15MS

Matrix Spike

R1201031-021MS7

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Nitrite as Nitrogen	ND	0.232	0.250	93	90 - 110

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/16/12 -
 2/17/12

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: mg/L
Basis: NA

LC34-IW0002I-027.5
 -20120215DUP

Duplicate Sample

R1201031-025DUP5

Analyte Name	Method	LOQ	Sample Result	Result	Average	RPD	RPD Limit
Bromide	300.0	1.0	1.0 U	1.0 U	NC	NC	20
Chloride	300.0	2.0	52.1	52.9	52.5	2	20
Nitrate as Nitrogen	300.0	1.0	1.0 U	1.0 U	NC	NC	20
Sulfate	300.0	2.0	44.3	44.2	44.3	<1	20

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/16/12 -
 2/17/12

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-IW0002I-027.5-20120215
Lab Code: R1201031-025

Units: mg/L
Basis: NA

Analytical Method: 300.0

LC34-IW0002I-027.5-20120215

MS

Matrix Spike

R1201031-025MS8

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Bromide	ND	9.9	10.0	99	90 - 110
Chloride	52.1	69.8	20.0	88 *	90 - 110
Nitrate as Nitrogen	ND	10.3	10.0	103	90 - 110
Sulfate	44.3	65.7	20.0	107	90 - 110

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/17/12 -
 2/24/12

**Replicate Sample Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: mg/L
Basis: NA

LC34-BW0001A-024
 .5-20120216DUP
Duplicate Sample

Analyte Name	Method	LOQ	Sample Result	Duplicate Sample		RPD	RPD Limit
				Result	Average		
Nitrite as Nitrogen	353.2	0.010	0.010 U	0.010 U	NC	NC	20
Alkalinity as CaCO ₃ , Total	SM 2320 B	2.0	241	240	241	<1	20

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/17/12 - 2/24/12

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: mg/L
Basis: NA

LC34-BW0001A-024.5-2
 0120216MS
Matrix Spike
 R1201031-038MS10

Analyte Name	Method	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity as CaCO ₃ , Total	SM 2320 B	241	340	100	99	70 - 110
Nitrite as Nitrogen	353.2	ND	0.257	0.250	103	90 - 110

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/17/12

**Matrix Spike Summary
 General Chemistry Parameters**

Sample Name: LC34-BW0001A-024.5-20120216
Lab Code: R1201031-038

Units: mg/L
Basis: NA

Analytical Method: 300.0

Analyte Name	Sample Result	LC34-BW0001A-024.5-201202 16MS Matrix Spike R1201031-038MS9			LC34-BW0001A-024.5-201202 16DMS Duplicate Matrix Spike R1201031-038DMS9			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Bromide	ND	9.9	10.0	99	9.9	10.0	99	90 - 110	<1	20
Chloride	65.8	84.3	20.0	93	83.5	20.0	89 *	90 - 110	<1	20
Nitrate as Nitrogen	ND	9.8	10.0	98	10.1	10.0	101	90 - 110	3	20
Sulfate	56.0	75.7	20.0	98	74.9	20.0	95	90 - 110	1	20

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/22/12

**Replicate Sample Summary
 Inorganic Parameters**

Sample Name: LC34-BW0001B-031.5-20120216 Dissolved
Lab Code: R1201031-041

Units: µg/L
Basis: NA

LC34-BW0001B-031.
 5-20120216
 DissolvedDUP

Duplicate Sample

Analyte Name	Method	LOQ	Sample Result	R1201031-041DUP2		RPD	RPD Limit
				Result	Average		
Arsenic, Dissolved	6010C	10	10 U	10 U	NC	NC	20
Iron, Dissolved	6010C	100	100 U	100 U	NC	NC	20
Manganese, Dissolved	6010C	10	17	17	16.9	<1	20

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/22/12

**Matrix Spike Summary
 Inorganic Parameters**

Sample Name: LC34-BW0001B-031.5-20120216 Dissolved
Lab Code: R1201031-041

Units: µg/L
Basis: NA

Analytical Method: 6010C
Prep Method: EPA 3010A

LC34-BW0001B-031.5-201202
 16 DissolvedMS
Matrix Spike
 R1201031-041MS2

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Arsenic, Dissolved	ND	39	40	98	75 - 125
Iron, Dissolved	ND	1060	1000	106	75 - 125
Manganese, Dissolved	17	527	500	102	75 - 125

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IW0071D-040.5-2012021 5MS LC34-IW0071D-040.5-2012021 5DMS

Matrix Spike **Duplicate Matrix Spike**
 RQ1201822-05 RQ1201822-06

Analyte Name	Sample Result	Matrix Spike			Duplicate Matrix Spike			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	58.4	50.0	117	59.3	50.0	119	76 - 142	2	30
1,1,2,2-Tetrachloroethane	ND	50.7	50.0	101	53.6	50.0	107	71 - 120	5	30
1,1,2-Trichloroethane	ND	50.8	50.0	102	51.6	50.0	103	80 - 119	2	30
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	51.1	50.0	102	50.3	50.0	101	65 - 154	2	30
1,1-Dichloroethane (1,1-DCA)	ND	60.3	50.0	121	60.7	50.0	121	79 - 134	<1	30
1,1-Dichloroethene (1,1-DCE)	ND	61.3	50.0	123	59.6	50.0	119	71 - 143	3	30
1,2,4-Trichlorobenzene	ND	49.3	50.0	99	52.8	50.0	106	75 - 118	7	30
1,2-Dibromo-3-chloropropane (DBC)	ND	45.3	50.0	91	47.2	50.0	94	60 - 125	4	30
1,2-Dibromoethane	ND	50.1	50.0	100	52.4	50.0	105	78 - 119	5	30
1,2-Dichlorobenzene	ND	52.8	50.0	106	54.5	50.0	109	82 - 117	3	30
1,2-Dichloroethane	ND	52.1	50.0	104	55.7	50.0	111	73 - 133	7	30
1,2-Dichloropropane	ND	57.1	50.0	114	57.5	50.0	115	84 - 124	<1	30
1,3-Dichlorobenzene	ND	52.1	50.0	104	55.4	50.0	111	82 - 117	6	30
1,4-Dichlorobenzene	ND	53.6	50.0	107	55.1	50.0	110	81 - 116	3	30
n-Butanol	ND	2430	2510	97	2660	2510	106	50 - 150	9	30
2-Butanone (MEK)	ND	45.4	50.0	91	45.2	50.0	90	54 - 130	<1	30
2-Hexanone	ND	45.9	50.0	92	46.8	50.0	94	55 - 125	2	30
4-Methyl-2-pentanone	ND	44.7	50.0	89	47.8	50.0	96	59 - 131	7	30
Acetone	ND	39.6	50.0	79	38.8	50.0	78	37 - 152	2	30
Benzene	ND	55.4	50.0	111	57.8	50.0	116	81 - 124	4	30
Bromodichloromethane	ND	57.0	50.0	114	59.1	50.0	118	81 - 126	4	30
Bromoform	ND	52.4	50.0	105	53.4	50.0	107	61 - 126	2	30
Bromomethane	ND	36.8	50.0	74	42.7	50.0	85	45 - 154	15	30
Carbon Disulfide	ND	70.8	50.0	142	70.2	50.0	140	32 - 149	<1	30
Carbon Tetrachloride	ND	60.5	50.0	121	61.8	50.0	124	71 - 146	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IW0071D-040.5-2012021 5MS LC34-IW0071D-040.5-2012021 SDMS

Matrix Spike
RQ1201822-05

Duplicate Matrix Spike
RQ1201822-06

Analyte Name	Sample Result	Matrix Spike			Duplicate Matrix Spike			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chlorobenzene	ND	54.1	50.0	108	55.6	50.0	111	80 - 125	3	30
Chloroethane	ND	62.4	50.0	125	59.6	50.0	119	68 - 148	5	30
Chloroform	ND	61.1	50.0	122	62.1	50.0	124	81 - 131	2	30
Chloromethane	ND	60.3	50.0	121	62.4	50.0	125	61 - 151	4	30
Cyclohexane	ND	53.6	50.0	107	52.3	50.0	105	59 - 144	2	30
Dibromochloromethane	ND	54.6	50.0	109	58.8	50.0	118	74 - 130	7	30
Dichlorodifluoromethane (CFC 12)	ND	51.5	50.0	103	51.6	50.0	103	44 - 175	<1	30
Dichloromethane	ND	56.8	50.0	114	56.9	50.0	114	78 - 125	<1	30
Ethylbenzene	ND	56.5	50.0	113	58.8	50.0	118	84 - 127	4	30
Isopropylbenzene (Cumene)	ND	55.2	50.0	110	57.4	50.0	115	82 - 140	4	30
Methyl Acetate	ND	50.4	50.0	101	48.9	50.0	98	38 - 156	3	30
Methyl tert-Butyl Ether	ND	51.3	50.0	103	52.1	50.0	104	75 - 126	1	30
Methylcyclohexane	ND	56.0	50.0	112	54.4	50.0	109	63 - 141	3	30
Styrene	ND	55.8	50.0	112	56.8	50.0	114	43 - 146	2	30
Tetrachloroethene (PCE)	ND	55.5	50.0	111	57.9	50.0	116	66 - 142	4	30
Toluene	ND	56.4	50.0	113	59.5	50.0	119	81 - 125	5	30
Trichloroethene (TCE)	ND	55.0	50.0	110	57.4	50.0	115	71 - 133	4	30
Trichlorofluoromethane (CFC 11)	ND	61.7	50.0	123	59.9	50.0	120	71 - 159	3	30
Vinyl Chloride	ND	61.1	50.0	122	61.3	50.0	123	72 - 154	<1	30
cis-1,2-Dichloroethene	ND	55.9	50.0	112	54.6	50.0	109	72 - 137	2	30
cis-1,3-Dichloropropene	ND	51.7	50.0	103	53.5	50.0	107	71 - 120	3	30
m,p-Xylenes	ND	111	100	111	116	100	116	80 - 129	4	30
n-Butyl Acetate	ND	46.3	50.0	93	46.2	50.0	92	18 - 159	<1	30
o-Xylene	ND	55.5	50.0	111	56.4	50.0	113	80 - 126	2	30
trans-1,2-Dichloroethene	ND	59.4	50.0	119	58.7	50.0	117	77 - 130	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0071D-040.5-20120215
Lab Code: R1201031-029

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-IW0071D-040.5-2012021 5MS Matrix Spike RQ1201822-05			LC34-IW0071D-040.5-2012021 5DMS Duplicate Matrix Spike RQ1201822-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
trans-1,3-Dichloropropene	ND	52.1	50.0	104	54.6	50.0	109	67 - 122	5	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/22/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IW0002D1-052.5-201202 16MS LC34-IW0002D1-052.5-201202 16DMS

Analyte Name	Sample Result	Matrix Spike RQ1201994-05			Duplicate Matrix Spike RQ1201994-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	1230	1250	99	1210	1250	97	76 - 142	1	30
1,1,2,2-Tetrachloroethane	ND	1160	1250	93	1160	1250	93	71 - 120	<1	30
1,1,2-Trichloroethane	ND	1170	1250	94	1180	1250	95	80 - 119	1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	47	1210	1250	93	1170	1250	90	65 - 154	3	30
1,1-Dichloroethane (1,1-DCA)	0.69	1260	1250	101	1250	1250	100	79 - 134	1	30
1,1-Dichloroethene (1,1-DCE)	0.99	1320	1250	106	1320	1250	105	71 - 143	<1	30
1,2,4-Trichlorobenzene	ND	1130	1250	91	1140	1250	91	75 - 118	<1	30
1,2-Dibromo-3-chloropropane (DBC)	ND	1120	1250	89	1190	1250	95	60 - 125	6	30
1,2-Dibromoethane	ND	1240	1250	99	1270	1250	102	78 - 119	3	30
1,2-Dichlorobenzene	ND	1210	1250	97	1210	1250	97	82 - 117	<1	30
1,2-Dichloroethane	ND	1240	1250	99	1240	1250	99	73 - 133	<1	30
1,2-Dichloropropane	ND	1240	1250	100	1240	1250	99	84 - 124	<1	30
1,3-Dichlorobenzene	ND	1240	1250	99	1220	1250	98	82 - 117	1	30
1,4-Dichlorobenzene	ND	1230	1250	98	1220	1250	97	81 - 116	<1	30
n-Butanol	ND	51200	62700	82	57700	62700	92	50 - 150	12	30
2-Butanone (MEK)	ND	953	1250	76	939	1250	75	54 - 130	1	30
2-Hexanone	ND	1060	1250	85	1070	1250	85	55 - 125	<1	30
4-Methyl-2-pentanone	ND	1020	1250	82	988	1250	79	59 - 131	3	30
Acetone	ND	1020	1250	81	1020	1250	82	37 - 152	<1	30
Benzene	ND	1250	1250	100	1240	1250	99	81 - 124	<1	30
Bromodichloromethane	ND	1230	1250	98	1240	1250	99	81 - 126	<1	30
Bromoform	ND	1210	1250	97	1290	1250	103	61 - 126	6	30
Bromomethane	ND	695	1250	56	756	1250	60	45 - 154	8	30
Carbon Disulfide	0.68	1360	1250	109	1310	1250	104	32 - 149	4	30
Carbon Tetrachloride	ND	1320	1250	105	1300	1250	104	71 - 146	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/22/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IW0002D1-052.5-201202 LC34-IW0002D1-052.5-201202

Analyte Name	Sample Result	16MS Matrix Spike RQ1201994-05			16DMS Duplicate Matrix Spike RQ1201994-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chlorobenzene	ND	1290	1250	103	1300	1250	104	80 - 125	1	30
Chloroethane	ND	1300	1250	104	1270	1250	101	68 - 148	2	30
Chloroform	ND	1240	1250	99	1220	1250	98	81 - 131	2	30
Chloromethane	ND	1290	1250	103	1250	1250	100	61 - 151	3	30
Cyclohexane	ND	1080	1250	87	1010	1250	81	59 - 144	7	30
Dibromochloromethane	ND	1340	1250	107	1370	1250	110	74 - 130	3	30
Dichlorodifluoromethane (CFC 12)	18	1220	1250	96	1150	1250	91	44 - 175	5	30
Dichloromethane	ND	1250	1250	100	1230	1250	98	78 - 125	1	30
Ethylbenzene	ND	1330	1250	106	1310	1250	105	84 - 127	1	30
Isopropylbenzene (Cumene)	ND	1320	1250	106	1340	1250	107	82 - 140	2	30
Methyl Acetate	ND	1070	1250	85	1050	1250	84	38 - 156	2	30
Methyl tert-Butyl Ether	ND	1100	1250	88	1120	1250	89	75 - 126	2	30
Methylcyclohexane	ND	1180	1250	94	1100	1250	88	63 - 141	7	30
Styrene	ND	1270	1250	101	1240	1250	99	43 - 146	2	30
Tetrachloroethene (PCE)	ND	1340	1250	107	1350	1250	108	66 - 142	<1	30
Toluene	ND	1250	1250	100	1250	1250	100	81 - 125	<1	30
Trichloroethene (TCE)	4.1	1260	1250	100	1230	1250	98	71 - 133	2	30
Trichlorofluoromethane (CFC 11)	ND	1290	1250	103	1260	1250	101	71 - 159	2	30
Vinyl Chloride	2000	3150	1250	91	3280	1250	101	72 - 154	4	30
cis-1,2-Dichloroethene	250	1470	1250	98	1460	1250	97	72 - 137	1	30
cis-1,3-Dichloropropene	ND	1100	1250	88	1090	1250	87	71 - 120	<1	30
m,p-Xylenes	ND	2710	2500	108	2700	2500	108	80 - 129	<1	30
n-Butyl Acetate	ND	1080	1250	86	1070	1250	86	18 - 159	<1	30
o-Xylene	ND	1310	1250	105	1320	1250	106	80 - 126	<1	30
trans-1,2-Dichloroethene	35	1280	1250	100	1280	1250	100	77 - 130	<1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/22/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IW0002D1-052.5-20120216
Lab Code: R1201031-052

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-IW0002D1-052.5-201202 16MS Matrix Spike RQ1201994-05			LC34-IW0002D1-052.5-201202 16DMS Duplicate Matrix Spike RQ1201994-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
trans-1,3-Dichloropropene	ND	1120	1250	89	1130	1250	90	67 - 122	<1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IDW-185539-20120216
Lab Code: R1201031-057

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IDW-185539-20120216 LC34-IDW-185539-20120216D

Analyte Name	Sample Result	MS Matrix Spike RQ1201947-05			MS Duplicate Matrix Spike RQ1201947-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	ND	499	500	100	495	500	99	76 - 142	<1	30
1,1,2,2-Tetrachloroethane	ND	524	500	105	543	500	109	71 - 120	4	30
1,1,2-Trichloroethane	ND	495	500	99	527	500	105	80 - 119	6	30
1,1,2-Trichloro-1,2,2-trifluoroethane	37	489	500	90	507	500	94	65 - 154	4	30
1,1-Dichloroethane (1,1-DCA)	ND	508	500	102	515	500	103	79 - 134	1	30
1,1-Dichloroethene (1,1-DCE)	ND	525	500	105	530	500	106	71 - 143	<1	30
1,2,4-Trichlorobenzene	ND	457	500	91	477	500	95	75 - 118	4	30
1,2-Dibromo-3-chloropropane (DBC)	ND	534	500	107	552	500	110	60 - 125	3	30
1,2-Dibromoethane	ND	530	500	106	562	500	112	78 - 119	6	30
1,2-Dichlorobenzene	ND	491	500	98	508	500	102	82 - 117	3	30
1,2-Dichloroethane	ND	517	500	103	545	500	109	73 - 133	5	30
1,2-Dichloropropane	ND	502	500	100	521	500	104	84 - 124	4	30
1,3-Dichlorobenzene	ND	490	500	98	499	500	100	82 - 117	2	30
1,4-Dichlorobenzene	ND	483	500	97	498	500	100	81 - 116	3	30
n-Butanol	ND	26200	25100	104	29700	25100	118	50 - 150	13	30
2-Butanone (MEK)	ND	531	500	106	554	500	111	54 - 130	4	30
2-Hexanone	ND	554	500	111	597	500	119	55 - 125	8	30
4-Methyl-2-pentanone	ND	532	500	106	561	500	112	59 - 131	5	30
Acetone	300	883	500	117	849	500	110	37 - 152	4	30
Benzene	ND	493	500	99	510	500	102	81 - 124	3	30
Bromodichloromethane	ND	514	500	103	531	500	106	81 - 126	3	30
Bromoform	ND	539	500	108	574	500	115	61 - 126	6	30
Bromomethane	ND	429	500	86	456	500	91	45 - 154	6	30
Carbon Disulfide	ND	528	500	106	542	500	108	32 - 149	3	30
Carbon Tetrachloride	ND	517	500	103	545	500	109	71 - 146	5	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IDW-185539-20120216
Lab Code: R1201031-057

Units: µg/L
Basis: NA

Analytical Method: 8260C

LC34-IDW-185539-20120216 LC34-IDW-185539-20120216D

Analyte Name	Sample Result	MS Matrix Spike RQ1201947-05			MS Duplicate Matrix Spike RQ1201947-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Chlorobenzene	ND	510	500	102	526	500	105	80 - 125	3	30
Chloroethane	ND	489	500	98	494	500	99	68 - 148	1	30
Chloroform	ND	500	500	100	511	500	102	81 - 131	2	30
Chloromethane	ND	559	500	112	570	500	114	61 - 151	2	30
Cyclohexane	ND	502	500	100	535	500	107	59 - 144	6	30
Dibromochloromethane	ND	555	500	111	589	500	118	74 - 130	6	30
Dichlorodifluoromethane (CFC 12)	ND	470	500	94	500	500	100	44 - 175	6	30
Dichloromethane	ND	500	500	100	506	500	101	78 - 125	1	30
Ethylbenzene	ND	510	500	102	525	500	105	84 - 127	3	30
Isopropylbenzene (Cumene)	ND	519	500	104	532	500	106	82 - 140	2	30
Methyl Acetate	ND	557	500	111	578	500	116	38 - 156	4	30
Methyl tert-Butyl Ether	ND	487	500	97	506	500	101	75 - 126	4	30
Methylcyclohexane	ND	504	500	101	531	500	106	63 - 141	5	30
Styrene	ND	509	500	102	526	500	105	43 - 146	3	30
Tetrachloroethene (PCE)	ND	511	500	102	523	500	105	66 - 142	2	30
Toluene	ND	496	500	99	511	500	102	81 - 125	3	30
Trichloroethene (TCE)	17	511	500	99	533	500	103	71 - 133	4	30
Trichlorofluoromethane (CFC 11)	ND	495	500	99	514	500	103	71 - 159	4	30
Vinyl Chloride	300	825	500	105	838	500	107	72 - 154	2	30
cis-1,2-Dichloroethene	1400	1950	500	110	1970	500	115	72 - 137	1	30
cis-1,3-Dichloropropene	ND	462	500	92	480	500	96	71 - 120	4	30
m,p-Xylenes	ND	1050	1000	105	1090	1000	109	80 - 129	4	30
n-Butyl Acetate	ND	579	500	116	612	500	122	18 - 159	6	30
o-Xylene	ND	521	500	104	533	500	107	80 - 126	2	30
trans-1,2-Dichloroethene	14	509	500	99	520	500	101	77 - 130	2	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/16/12
Date Received: 2/17/12
Date Analyzed: 2/21/12

Matrix Spike Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Sample Name: LC34-IDW-185539-20120216
Lab Code: R1201031-057

Units: µg/L
Basis: NA

Analytical Method: 8260C

Analyte Name	Sample Result	LC34-IDW-185539-20120216 MS Matrix Spike RQ1201947-05			LC34-IDW-185539-20120216D MS Duplicate Matrix Spike RQ1201947-06			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
trans-1,3-Dichloropropene	ND	468	500	94	497	500	99	67 - 122	6	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/23/12

**Matrix Spike Summary
Dissolved Gases by GC/FID**

Sample Name: LC34-BW0003D-045.5-20120215
Lab Code: R1201031-022

Units: µg/L
Basis: NA

Analytical Method: RSK 175

Analyte Name	Sample Result	LC34-BW0003D-045.5-201202 15MS Matrix Spike RQ1201921-03			LC34-BW0003D-045.5-201202 15DMS Duplicate Matrix Spike RQ1201921-04			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	ND	1500	1300	115	1570	1300	120	57 - 133	4	30
Ethene	310	1600	1220	106	1640	1220	110	58 - 135	2	30
Methane	1700	2770	1310	84	2800	1310	86	47 - 146	1	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Collected: 2/15/12
Date Received: 2/16/12
Date Analyzed: 2/20/12 -
 2/22/12

Matrix Spike Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: LC34-BW0002A-024.5-20120215
Lab Code: R1201031-017

Units: mg/L
Basis: NA

Analytical Method: Organic Acids

Analyte Name	Sample Result	LC34-BW0002A-024.5-201202 15MS Matrix Spike RQ1201891-04			LC34-BW0002A-024.5-201202 15DMS Duplicate Matrix Spike RQ1201891-05			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	ND	0.770	1.00	77	0.830	1.00	83	25 - 152	7	30
Acetic Acid	100	98.6	10.3	-18 #	101	10.3	2 #	13 - 167	2	30
Butanoic Acid (Butyric Acid)	ND	8.83	10.1	87	11.0	10.1	109	49 - 145	22	30
Lactic Acid	ND	7.35	10.0	73	7.84	10.0	78	27 - 127	6	30
Propionic Acid	ND	8.59	10.1	85	9.36	10.1	93	68 - 133	9	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/17/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1201031-LCS1			Duplicate Lab Control Sample R1201031-DLCS1			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Sulfide, Total	SM 4500-S2- F	8.85	8.4	106	8.66	8.4	104	56 - 138	2	20

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/15/12 -
 2/28/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1201031-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	0.976	1.00	98	90 - 110
Chloride	300.0	1.98	2.00	99	90 - 110
Iodide	300.0	1.00	1.00	100	90 - 110
Nitrate as Nitrogen	300.0	0.971	1.00	97	90 - 110
Nitrite as Nitrogen	353.2	0.247	0.250	99	90 - 110
Sulfate	300.0	1.89	2.00	95	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	21.0	20.0	105	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.83	10.0	98	86 - 117

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COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/16/12 -
2/28/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L

Basis: NA

**Lab Control Sample
 R1201031-LCS3**

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Chloride	300.0	2.06	2.00	103	90 - 110
Iodide	300.0	1.04	1.00	104	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110
Nitrite as Nitrogen	353.2	0.234	0.250	94	90 - 110
Sulfate	300.0	2.01	2.00	101	90 - 110
Alkalinity as CaCO ₃ , Total	SM 2320 B	19.0	20.0	95	72 - 115
Carbon, Total Organic (TOC), Average	9060A	9.77	10.0	98	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/17/12 -
 2/25/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

**Lab Control Sample
 R1201031-LCS4**

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	0.954	1.00	95	90 - 110
Chloride	300.0	1.96	2.00	98	90 - 110
Nitrate as Nitrogen	300.0	0.967	1.00	97	90 - 110
Nitrite as Nitrogen	353.2	0.251	0.250	101	90 - 110
Sulfate	300.0	1.91	2.00	96	90 - 110
Carbon, Total Organic (TOC), Average	9060A	9.86	10.0	99	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/17/12 -
2/27/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R1201031-LCS5

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	1.02	1.00	102	90 - 110
Chloride	300.0	2.05	2.00	103	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110
Sulfate	300.0	2.01	2.00	101	90 - 110
Carbon, Total Organic (TOC), Average	9060A	9.79	10.0	98	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/17/12 -
 3/ 1/12

**Lab Control Sample Summary
 General Chemistry Parameters**

Units: mg/L
Basis: NA

Lab Control Sample
 R1201031-LCS6

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Bromide	300.0	1.02	1.00	102	90 - 110
Chloride	300.0	1.95	2.00	98	90 - 110
Nitrate as Nitrogen	300.0	1.03	1.00	103	90 - 110
Sulfate	300.0	2.02	2.00	101	90 - 110
Carbon, Total Organic (TOC), Average	9060A	10.1	10.0	101	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/20/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1201031-LCS7			% Rec Limits
		Result	Spike Amount	% Rec	
Bromide	300.0	1.01	1.00	101	90 - 110
Chloride	300.0	2.06	2.00	103	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/21/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R1201031-LCS8

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Chloride	300.0	1.98	2.00	99	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/21/12

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L

Basis: NA

Lab Control Sample

R1201031-LCS9

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Chloride	300.0	2.05	2.00	102	90 - 110

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/20/12

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L
Basis: NA

Lab Control Sample
R1201031-LCS1

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	39.7	40	99	80 - 120
Iron, Dissolved	6010C	948	1000	95	80 - 120
Manganese, Dissolved	6010C	464	500	93	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/22/12

Lab Control Sample Summary
Inorganic Parameters

Units: µg/L

Basis: NA

Lab Control Sample
R1201031-LCS2

Analyte Name	Method	Result	Spike		% Rec Limits
			Amount	% Rec	
Arsenic, Dissolved	6010C	36.2	40	91	80 - 120
Iron, Dissolved	6010C	1020	1000	102	80 - 120
Manganese, Dissolved	6010C	504	500	101	80 - 120

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280472

Lab Control Sample
RQ1201955-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.6	20.0	83	72 - 128
1,1,2,2-Tetrachloroethane	19.2	20.0	96	72 - 131
1,1,2-Trichloroethane	18.2	20.0	91	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.6	20.0	78	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.9	20.0	90	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.9	20.0	90	72 - 129
1,2,4-Trichlorobenzene	18.7	20.0	94	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.2	20.0	96	62 - 131
1,2-Dibromoethane	20.4	20.0	102	78 - 125
1,2-Dichlorobenzene	18.9	20.0	94	79 - 124
1,2-Dichloroethane	18.9	20.0	95	73 - 127
1,2-Dichloropropane	17.9	20.0	90	80 - 123
1,3-Dichlorobenzene	18.6	20.0	93	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	900	1000	90	70 - 130
2-Butanone (MEK)	17.7	20.0	89	60 - 133
2-Hexanone	18.9	20.0	94	61 - 131
4-Methyl-2-pentanone	18.0	20.0	90	61 - 132
Acetone	18.2	20.0	91	54 - 139
Benzene	17.2	20.0	86	78 - 121
Bromodichloromethane	18.1	20.0	91	80 - 125
Bromoform	18.6	20.0	93	68 - 130
Bromomethane	17.2	20.0	86	57 - 144
Carbon Disulfide	17.6	20.0	88	52 - 140
Carbon Tetrachloride	16.7	20.0	84	68 - 133
Chlorobenzene	18.2	20.0	91	80 - 121
Chloroethane	16.9	20.0	85	71 - 130
Chloroform	17.6	20.0	88	78 - 125
Chloromethane	19.6	20.0	98	61 - 138
Cyclohexane	16.9	20.0	84	57 - 126
Dibromochloromethane	20.2	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	16.7	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280472

Lab Control Sample

RQ1201955-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.1	20.0	90	75 - 125
Ethylbenzene	17.7	20.0	89	78 - 123
Isopropylbenzene (Cumene)	17.8	20.0	89	73 - 133
Methyl Acetate	19.3	20.0	97	57 - 157
Methyl tert-Butyl Ether	17.7	20.0	88	75 - 126
Methylcyclohexane	17.4	20.0	87	61 - 125
Styrene	18.1	20.0	91	80 - 132
Tetrachloroethene (PCE)	17.9	20.0	89	72 - 131
Toluene	17.0	20.0	85	78 - 122
Trichloroethene (TCE)	16.6	20.0	83	74 - 127
Trichlorofluoromethane (CFC 11)	17.4	20.0	87	69 - 141
Vinyl Chloride	16.9	20.0	84	72 - 138
cis-1,2-Dichloroethene	17.8	20.0	89	78 - 122
cis-1,3-Dichloropropene	16.9	20.0	85	77 - 125
m,p-Xylenes	36.4	40.0	91	79 - 126
n-Butyl Acetate	19.9	20.0	99	31 - 144
o-Xylene	18.2	20.0	91	77 - 118
trans-1,2-Dichloroethene	17.1	20.0	86	75 - 121
trans-1,3-Dichloropropene	17.5	20.0	87	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280661

**Lab Control Sample
 RQ1201851-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.3	20.0	96	72 - 128
1,1,2,2-Tetrachloroethane	19.9	20.0	100	72 - 131
1,1,2-Trichloroethane	18.5	20.0	93	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.2	20.0	86	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.4	20.0	97	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.8	20.0	99	72 - 129
1,2,4-Trichlorobenzene	18.4	20.0	92	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.3	20.0	91	62 - 131
1,2-Dibromoethane	19.7	20.0	99	78 - 125
1,2-Dichlorobenzene	19.8	20.0	99	79 - 124
1,2-Dichloroethane	19.9	20.0	99	73 - 127
1,2-Dichloropropane	19.4	20.0	97	80 - 123
1,3-Dichlorobenzene	19.7	20.0	99	78 - 124
1,4-Dichlorobenzene	19.6	20.0	98	78 - 123
n-Butanol	851	1000	85	70 - 130
2-Butanone (MEK)	17.0	20.0	85	60 - 133
2-Hexanone	18.4	20.0	92	61 - 131
4-Methyl-2-pentanone	17.4	20.0	87	61 - 132
Acetone	15.2	20.0	76	54 - 139
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	19.7	20.0	98	80 - 125
Bromoform	19.4	20.0	97	68 - 130
Bromomethane	17.8	20.0	89	57 - 144
Carbon Disulfide	18.4	20.0	92	52 - 140
Carbon Tetrachloride	20.3	20.0	102	68 - 133
Chlorobenzene	20.3	20.0	101	80 - 121
Chloroethane	18.8	20.0	94	71 - 130
Chloroform	19.4	20.0	97	78 - 125
Chloromethane	21.8	20.0	109	61 - 138
Cyclohexane	16.3	20.0	81	57 - 126
Dibromochloromethane	21.0	20.0	105	78 - 133
Dichlorodifluoromethane (CFC 12)	20.2	20.0	101	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280661

Lab Control Sample

RQ1201851-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.1	20.0	95	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	20.1	20.0	100	73 - 133
Methyl Acetate	18.2	20.0	91	57 - 157
Methyl tert-Butyl Ether	17.7	20.0	89	75 - 126
Methylcyclohexane	16.3	20.0	82	61 - 125
Styrene	19.1	20.0	96	80 - 132
Tetrachloroethene (PCE)	19.7	20.0	99	72 - 131
Toluene	19.3	20.0	96	78 - 122
Trichloroethene (TCE)	18.7	20.0	94	74 - 127
Trichlorofluoromethane (CFC 11)	19.4	20.0	97	69 - 141
Vinyl Chloride	20.0	20.0	100	72 - 138
cis-1,2-Dichloroethene	18.7	20.0	94	78 - 122
cis-1,3-Dichloropropene	18.3	20.0	92	77 - 125
m,p-Xylenes	41.2	40.0	103	79 - 126
n-Butyl Acetate	18.8	20.0	94	31 - 144
o-Xylene	20.2	20.0	101	77 - 118
trans-1,2-Dichloroethene	19.2	20.0	96	75 - 121
trans-1,3-Dichloropropene	18.7	20.0	94	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280656

Lab Control Sample

RQ1201822-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	20.1	20.0	100	72 - 131
1,1,2-Trichloroethane	20.4	20.0	102	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.1	20.0	81	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.4	20.0	107	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.1	20.0	95	72 - 129
1,2,4-Trichlorobenzene	19.7	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.8	20.0	94	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	20.4	20.0	102	79 - 124
1,2-Dichloroethane	21.3	20.0	106	73 - 127
1,2-Dichloropropane	20.9	20.0	105	80 - 123
1,3-Dichlorobenzene	20.1	20.0	101	78 - 124
1,4-Dichlorobenzene	20.4	20.0	102	78 - 123
n-Butanol	1080	1000	107	70 - 130
2-Butanone (MEK)	15.0	20.0	75	60 - 133
2-Hexanone	15.1	20.0	76	61 - 131
4-Methyl-2-pentanone	15.5	20.0	78	61 - 132
Acetone	13.4	20.0	67	54 - 139
Benzene	19.8	20.0	99	78 - 121
Bromodichloromethane	21.8	20.0	109	80 - 125
Bromoform	20.9	20.0	104	68 - 130
Bromomethane	18.4	20.0	92	57 - 144
Carbon Disulfide	20.0	20.0	100	52 - 140
Carbon Tetrachloride	20.6	20.0	103	68 - 133
Chlorobenzene	20.6	20.0	103	80 - 121
Chloroethane	19.8	20.0	99	71 - 130
Chloroform	21.9	20.0	110	78 - 125
Chloromethane	21.7	20.0	109	61 - 138
Cyclohexane	19.2	20.0	96	57 - 126
Dibromochloromethane	21.8	20.0	109	78 - 133
Dichlorodifluoromethane (CFC 12)	16.9	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280656

Lab Control Sample

RQ1201822-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.1	20.0	105	75 - 125
Ethylbenzene	20.4	20.0	102	78 - 123
Isopropylbenzene (Cumene)	19.7	20.0	99	73 - 133
Methyl Acetate	19.5	20.0	98	57 - 157
Methyl tert-Butyl Ether	20.5	20.0	103	75 - 126
Methylcyclohexane	22.0	20.0	110	61 - 125
Styrene	21.0	20.0	105	80 - 132
Tetrachloroethene (PCE)	19.3	20.0	96	72 - 131
Toluene	20.3	20.0	101	78 - 122
Trichloroethene (TCE)	18.4	20.0	92	74 - 127
Trichlorofluoromethane (CFC 11)	19.8	20.0	99	69 - 141
Vinyl Chloride	20.3	20.0	101	72 - 138
cis-1,2-Dichloroethene	19.7	20.0	98	78 - 122
cis-1,3-Dichloropropene	20.5	20.0	103	77 - 125
m,p-Xylenes	41.2	40.0	103	79 - 126
n-Butyl Acetate	17.2	20.0	86	31 - 144
o-Xylene	20.7	20.0	104	77 - 118
trans-1,2-Dichloroethene	19.8	20.0	99	75 - 121
trans-1,3-Dichloropropene	20.9	20.0	105	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280843

Lab Control Sample

RQ1202134-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.6	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	22.0	20.0	110	72 - 131
1,1,2-Trichloroethane	20.0	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.7	20.0	89	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.4	20.0	107	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.9	20.0	104	72 - 129
1,2,4-Trichlorobenzene	19.8	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	20.9	20.0	105	62 - 131
1,2-Dibromoethane	21.9	20.0	109	78 - 125
1,2-Dichlorobenzene	20.4	20.0	102	79 - 124
1,2-Dichloroethane	20.1	20.0	101	73 - 127
1,2-Dichloropropane	19.9	20.0	100	80 - 123
1,3-Dichlorobenzene	20.0	20.0	100	78 - 124
1,4-Dichlorobenzene	20.1	20.0	100	78 - 123
n-Butanol	1300	1000	130	70 - 130
2-Butanone (MEK)	20.6	20.0	103	60 - 133
2-Hexanone	20.7	20.0	104	61 - 131
4-Methyl-2-pentanone	20.3	20.0	101	61 - 132
Acetone	14.5	20.0	73	54 - 139
Benzene	19.2	20.0	96	78 - 121
Bromodichloromethane	20.7	20.0	103	80 - 125
Bromoform	21.5	20.0	107	68 - 130
Bromomethane	17.4	20.0	87	57 - 144
Carbon Disulfide	22.3	20.0	112	52 - 140
Carbon Tetrachloride	19.5	20.0	97	68 - 133
Chlorobenzene	20.3	20.0	102	80 - 121
Chloroethane	20.7	20.0	103	71 - 130
Chloroform	22.1	20.0	111	78 - 125
Chloromethane	21.2	20.0	106	61 - 138
Cyclohexane	17.1	20.0	86	57 - 126
Dibromochloromethane	21.6	20.0	108	78 - 133
Dichlorodifluoromethane (CFC 12)	17.4	20.0	87	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/21/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 280843

**Lab Control Sample
 RQ1202134-03**

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
Dichloromethane	20.8	20.0	104	75 - 125
Ethylbenzene	20.4	20.0	102	78 - 123
Isopropylbenzene (Cumene)	19.9	20.0	99	73 - 133
Methyl Acetate	21.4	20.0	107	57 - 157
Methyl tert-Butyl Ether	21.4	20.0	107	75 - 126
Methylcyclohexane	18.4	20.0	92	61 - 125
Styrene	20.1	20.0	100	80 - 132
Tetrachloroethene (PCE)	19.4	20.0	97	72 - 131
Toluene	20.1	20.0	100	78 - 122
Trichloroethene (TCE)	19.2	20.0	96	74 - 127
Trichlorofluoromethane (CFC 11)	20.1	20.0	101	69 - 141
Vinyl Chloride	20.7	20.0	103	72 - 138
cis-1,2-Dichloroethene	19.6	20.0	98	78 - 122
cis-1,3-Dichloropropene	19.5	20.0	97	77 - 125
m,p-Xylenes	39.5	40.0	99	79 - 126
n-Butyl Acetate	18.8	20.0	94	31 - 144
o-Xylene	20.4	20.0	102	77 - 118
trans-1,2-Dichloroethene	20.9	20.0	104	75 - 121
trans-1,3-Dichloropropene	20.1	20.0	101	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 280878

Lab Control Sample
RQ1201947-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.7	20.0	83	72 - 128
1,1,2,2-Tetrachloroethane	22.2	20.0	111	72 - 131
1,1,2-Trichloroethane	19.1	20.0	96	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.7	20.0	79	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.8	20.0	89	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.5	20.0	87	72 - 129
1,2,4-Trichlorobenzene	18.1	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.2	20.0	106	62 - 131
1,2-Dibromoethane	20.6	20.0	103	78 - 125
1,2-Dichlorobenzene	19.7	20.0	99	79 - 124
1,2-Dichloroethane	20.1	20.0	101	73 - 127
1,2-Dichloropropane	18.9	20.0	95	80 - 123
1,3-Dichlorobenzene	19.2	20.0	96	78 - 124
1,4-Dichlorobenzene	19.3	20.0	97	78 - 123
n-Butanol	989	1000	99	70 - 130
2-Butanone (MEK)	18.4	20.0	92	60 - 133
2-Hexanone	19.6	20.0	98	61 - 131
4-Methyl-2-pentanone	18.8	20.0	94	61 - 132
Acetone	16.0	20.0	80	54 - 139
Benzene	17.8	20.0	89	78 - 121
Bromodichloromethane	19.0	20.0	95	80 - 125
Bromoform	20.5	20.0	103	68 - 130
Bromomethane	16.3	20.0	81	57 - 144
Carbon Disulfide	19.8	20.0	99	52 - 140
Carbon Tetrachloride	18.0	20.0	90	68 - 133
Chlorobenzene	19.0	20.0	95	80 - 121
Chloroethane	17.1	20.0	86	71 - 130
Chloroform	17.9	20.0	90	78 - 125
Chloromethane	19.0	20.0	95	61 - 138
Cyclohexane	17.1	20.0	85	57 - 126
Dibromochloromethane	21.8	20.0	109	78 - 133
Dichlorodifluoromethane (CFC 12)	16.0	20.0	80	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 280878

Lab Control Sample
RQ1201947-02

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
Dichloromethane	18.7	20.0	94	75 - 125
Ethylbenzene	18.2	20.0	91	78 - 123
Isopropylbenzene (Cumene)	18.5	20.0	93	73 - 133
Methyl Acetate	19.2	20.0	96	57 - 157
Methyl tert-Butyl Ether	18.3	20.0	91	75 - 126
Methylcyclohexane	17.6	20.0	88	61 - 125
Styrene	18.8	20.0	94	80 - 132
Tetrachloroethene (PCE)	17.9	20.0	89	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	17.1	20.0	85	74 - 127
Trichlorofluoromethane (CFC 11)	16.9	20.0	85	69 - 141
Vinyl Chloride	17.6	20.0	88	72 - 138
cis-1,2-Dichloroethene	17.5	20.0	88	78 - 122
cis-1,3-Dichloropropene	18.2	20.0	91	77 - 125
m,p-Xylenes	37.8	40.0	94	79 - 126
n-Butyl Acetate	19.8	20.0	99	31 - 144
o-Xylene	19.2	20.0	96	77 - 118
trans-1,2-Dichloroethene	17.1	20.0	86	75 - 121
trans-1,3-Dichloropropene	18.9	20.0	95	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 281034

Lab Control Sample
RQ1201994-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	15.8	20.0	79	72 - 128
1,1,2,2-Tetrachloroethane	19.1	20.0	95	72 - 131
1,1,2-Trichloroethane	18.3	20.0	92	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.2	20.0	76	68 - 136
1,1-Dichloroethane (1,1-DCA)	17.2	20.0	86	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.4	20.0	87	72 - 129
1,2,4-Trichlorobenzene	17.5	20.0	87	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.9	20.0	95	62 - 131
1,2-Dibromoethane	20.1	20.0	100	78 - 125
1,2-Dichlorobenzene	18.6	20.0	93	79 - 124
1,2-Dichloroethane	18.7	20.0	93	73 - 127
1,2-Dichloropropane	18.3	20.0	92	80 - 123
1,3-Dichlorobenzene	18.2	20.0	91	78 - 124
1,4-Dichlorobenzene	18.5	20.0	92	78 - 123
n-Butanol	945	1000	94	70 - 130
2-Butanone (MEK)	15.6	20.0	78	60 - 133
2-Hexanone	17.1	20.0	85	61 - 131
4-Methyl-2-pentanone	16.5	20.0	82	61 - 132
Acetone	15.6	20.0	78	54 - 139
Benzene	17.3	20.0	87	78 - 121
Bromodichloromethane	18.0	20.0	90	80 - 125
Bromoform	18.8	20.0	94	68 - 130
Bromomethane	16.0	20.0	80	57 - 144
Carbon Disulfide	15.0	20.0	75	52 - 140
Carbon Tetrachloride	16.8	20.0	84	68 - 133
Chlorobenzene	18.6	20.0	93	80 - 121
Chloroethane	16.8	20.0	84	71 - 130
Chloroform	17.2	20.0	86	78 - 125
Chloromethane	17.1	20.0	86	61 - 138
Cyclohexane	15.0	20.0	75	57 - 126
Dibromochloromethane	20.6	20.0	103	78 - 133
Dichlorodifluoromethane (CFC 12)	15.3	20.0	76	45 - 159

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 281034

Lab Control Sample
RQ1201994-02

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
Dichloromethane	17.9	20.0	90	75 - 125
Ethylbenzene	17.8	20.0	89	78 - 123
Isopropylbenzene (Cumene)	17.9	20.0	89	73 - 133
Methyl Acetate	17.4	20.0	87	57 - 157
Methyl tert-Butyl Ether	17.2	20.0	86	75 - 126
Methylcyclohexane	16.7	20.0	84	61 - 125
Styrene	17.9	20.0	89	80 - 132
Tetrachloroethene (PCE)	17.4	20.0	87	72 - 131
Toluene	17.4	20.0	87	78 - 122
Trichloroethene (TCE)	17.0	20.0	85	74 - 127
Trichlorofluoromethane (CFC 11)	16.6	20.0	83	69 - 141
Vinyl Chloride	16.8	20.0	84	72 - 138
cis-1,2-Dichloroethene	16.9	20.0	85	78 - 122
cis-1,3-Dichloropropene	17.3	20.0	86	77 - 125
m,p-Xylenes	36.9	40.0	92	79 - 126
n-Butyl Acetate	17.7	20.0	88	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	17.0	20.0	85	75 - 121
trans-1,3-Dichloropropene	17.3	20.0	86	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/23/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 281208

Lab Control Sample
RQ1202074-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.9	20.0	110	72 - 128
1,1,2,2-Tetrachloroethane	22.0	20.0	110	72 - 131
1,1,2-Trichloroethane	19.9	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.2	20.0	101	68 - 136
1,1-Dichloroethane (1,1-DCA)	22.0	20.0	110	76 - 124
1,1-Dichloroethene (1,1-DCE)	22.3	20.0	111	72 - 129
1,2,4-Trichlorobenzene	21.7	20.0	108	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.3	20.0	96	62 - 131
1,2-Dibromoethane	20.4	20.0	102	78 - 125
1,2-Dichlorobenzene	22.0	20.0	110	79 - 124
1,2-Dichloroethane	21.2	20.0	106	73 - 127
1,2-Dichloropropane	21.3	20.0	106	80 - 123
1,3-Dichlorobenzene	22.0	20.0	110	78 - 124
1,4-Dichlorobenzene	22.1	20.0	111	78 - 123
n-Butanol	967	1000	96	70 - 130
2-Butanone (MEK)	17.8	20.0	89	60 - 133
2-Hexanone	16.9	20.0	85	61 - 131
4-Methyl-2-pentanone	16.2	20.0	81	61 - 132
Acetone	15.9	20.0	79	54 - 139
Benzene	21.4	20.0	107	78 - 121
Bromodichloromethane	21.9	20.0	110	80 - 125
Bromoform	20.6	20.0	103	68 - 130
Bromomethane	17.2	20.0	86	57 - 144
Carbon Disulfide	24.4	20.0	122	52 - 140
Carbon Tetrachloride	23.5	20.0	118	68 - 133
Chlorobenzene	22.0	20.0	110	80 - 121
Chloroethane	22.9	20.0	114	71 - 130
Chloroform	23.9	20.0	120	78 - 125
Chloromethane	22.4	20.0	112	61 - 138
Cyclohexane	16.7	20.0	83	57 - 126
Dibromochloromethane	21.9	20.0	110	78 - 133
Dichlorodifluoromethane (CFC 12)	19.1	20.0	96	45 - 159

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/23/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 281208

Lab Control Sample

RQ1202074-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.9	20.0	109	75 - 125
Ethylbenzene	22.8	20.0	114	78 - 123
Isopropylbenzene (Cumene)	22.5	20.0	113	73 - 133
Methyl Acetate	18.6	20.0	93	57 - 157
Methyl tert-Butyl Ether	20.0	20.0	100	75 - 126
Methylcyclohexane	18.6	20.0	93	61 - 125
Styrene	21.8	20.0	109	80 - 132
Tetrachloroethene (PCE)	22.1	20.0	110	72 - 131
Toluene	22.3	20.0	112	78 - 122
Trichloroethene (TCE)	22.2	20.0	111	74 - 127
Trichlorofluoromethane (CFC 11)	21.9	20.0	109	69 - 141
Vinyl Chloride	22.9	20.0	114	72 - 138
cis-1,2-Dichloroethene	21.1	20.0	105	78 - 122
cis-1,3-Dichloropropene	20.6	20.0	103	77 - 125
m,p-Xylenes	44.1	40.0	110	79 - 126
n-Butyl Acetate	15.8	20.0	79	31 - 144
o-Xylene	21.8	20.0	109	77 - 118
trans-1,2-Dichloroethene	22.9	20.0	114	75 - 121
trans-1,3-Dichloropropene	20.8	20.0	104	69 - 127

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/22/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 280938

Lab Control Sample

RQ1201868-02

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
Ethane	29.7	26.0	114	56 - 148
Ethene	26.4	24.3	109	58 - 155
Methane	29.7	26.2	113	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/23/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 281108

Lab Control Sample
RQ1201921-02

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
Ethane	29.2	26.0	112	56 - 148
Ethene	26.4	24.3	108	58 - 155
Methane	28.9	26.2	110	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031

Date Analyzed: 2/27/12

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 281444

Analyte Name	Lab Control Sample RQ1202015-02			Duplicate Lab Control Sample RQ1202015-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	23.2	26.0	89	22.3	26.0	86	56 - 148	4	30
Ethene	19.8	24.3	81	19.3	24.3	79	58 - 155	2	30
Methane	23.4	26.2	89	22.5	26.2	86	55 - 150	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/28/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L
Basis: NA

Analysis Lot: 281606

Lab Control Sample
RQ1202058-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	29.9	26.0	115	56 - 148
Ethene	26.5	24.3	109	58 - 155
Methane	30.2	26.2	115	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/20/12

Lab Control Sample Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 281004

Analyte Name	Lab Control Sample RQ1201891-02			Duplicate Lab Control Sample RQ1201891-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.07	1.00	107	1.04	1.00	104	70 - 130	3	30
Acetic Acid	9.74	10.3	95	9.65	10.3	94	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.6	10.1	104	10.5	10.1	103	78 - 113	1	30
Lactic Acid	9.15	10.0	91	8.83	10.0	88	61 - 109	4	30
Propionic Acid	9.46	10.1	94	9.44	10.1	94	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 2/14-16/12/ TR0272A
Sample Matrix: Water

Service Request: R1201031
Date Analyzed: 2/21/12

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analytical Method: Organic Acids

Units: mg/L
Basis: NA

Analysis Lot: 281004

Analyte Name	Lab Control Sample RQ1201891-07			Duplicate Lab Control Sample RQ1201891-08			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Pyruvic Acid	1.07	1.00	107	1.04	1.00	104	70 - 130	3	30
Acetic Acid	9.68	10.3	94	9.60	10.3	94	70 - 135	<1	30
Butanoic Acid (Butyric Acid)	10.6	10.1	104	10.6	10.1	104	78 - 113	<1	30
Lactic Acid	9.43	10.0	94	9.09	10.0	91	61 - 109	4	30
Propionic Acid	9.99	10.1	99	9.90	10.1	98	80 - 125	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH. 585-288-5380 FAX. 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Analysis Requested								REMARKS		
					VOCs (8260) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEBs (RSK 175)	Anions (300.0)	Alkalinity (310.1)		Dissolved Metals (6010B)	
LC34-RW0007-038.5-20120214	2/14/2012	1018	-001, 002	W	3	1	1	3	1	3	1	1	1	1	
LC34-RW0008-052.0-20120214	2/14/2012	1110	-003, 004	W	3	1	1	3	1	3	1	1	1	1	
LC34-BW0002C-038.5-20120214	2/14/2012	1444	-005, 006, 007, 008, 009, 010, 011, 012	W	3	1	1	3	1	3	1	1	1	1	
LC34-BW0002D-045.5-20120214	2/14/2012	1410	-006	W	3	1	1	3		3					
LC34-BW0002E-052.5-20120214	2/14/2012	1326	-007	W	3	1	1	3		3					
LC34-BW0002F-059.5-20120214	2/14/2012	1245	-008	W	3	1	1	3		3					
LC34-IW0067D-040.5-20120214	2/14/2012	1415	-009	W	3			3		3					
LC34-IW0067D1-068.0-20120214	2/14/2012	1346	-010	W	3			3		3					
LC34-IW0071D1-070.0-20120214	2/14/2012	1454	-012-011, 013, 014, 015	W	3			3		3					

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results _____
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 2/14/12-1630

REINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 2/14/12-1630

Comments/Special Instructions:
 Please filter dissolved metals in lab.
 2 cosbwr

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Kufens
 Firm: ALS
 Date/Time: 2/15/12 0945

REINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results _____
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 2/14/12-1630

REINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 2/14/12-1630

002067

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Corv Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Analysis Requested

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
3	3									
1	1								1	
1	1						1			
3	3									
3	3									

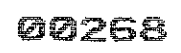
REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

RECEIVED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARTELT
 Firm: Geosyntec
 Date/Time: 2/14/12 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: [Signature]
 Firm: ALS
 Date/Time: 2/15/12 - 0945

2 copies
 R12001031





Cooler Receipt and Preservation Check Form

Project/Client Asbestos Folder Number R201031

Cooler received on 2/15/12 by: RD COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/RCO, CLIENT
 - Temperature of cooler(s) upon receipt: 5.7° 3.2° 4.6° 2.1°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/15/12 0952

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>R-002</u>	by	<u>RD</u>	on	<u>2/15/12</u>	at	<u>1000</u>
5035 samples placed in storage location	<u>F-01</u>	by	<u>RD</u>	on	<u>2/15/12</u>	at	<u>1000</u>

PC Secondary Review: KB 2/15/12

Cooler Breakdown: Date: 2/15/12 Time: 1250 by: RD

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 - Did all bottle labels and tags agree with custody papers? YES NO
 - Were correct containers used for the tests indicated? YES NO
 - Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: Did not receive LC34-FD-201202214-01 TOC vial

pH	Reagent	Lot Received		Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO					
≥12	NaOH		<u>WC103138C</u>	<u>1/13</u>				
≤2	HNO ₃							
≤2	H ₂ SO ₄		<u>WC103193G</u>	<u>1/13</u>				
<4	NaHSO ₄							
Residual Chlorine (-)	For TCN Phenol and 522		If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	<u>WC103265B</u>	<u>2/12</u>				
	HCl	*	<u>4111060</u>	<u>1/13</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust:

Bottle lot numbers: 0-286-002, 1-286-001, 12/211-22X, 060611-1W, 062711-2Z, 1-194-002
Other Comments:

H₃PO₄ lot: WC103104G Exp. 1/13 06

PC Secondary Review: KB 3/6/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-Butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0002A-024.5-20120215	2/15/2012	1112	-017	W	13	3	3	1	3	3	3				QC - VFAs ✓
LC34-BW0002B-031.5-20120215	2/15/2012	1024	-018	W	14	3	1	1	6		3				QC - TOC
LC34-BW0003A-024.5-20120215	2/15/2012	1305	-019	W	11	3	1	1	3		3				
LC34-BW0003B-031.5-20120215	2/15/2012	1228	-020	W	12	3	1	2	3		3				QC - Brand I
LC34-BW0003C-038.5-20120215	2/15/2012	1150	-021	W	15	3	1	1	3	2	3	1	1		QC - Sulfide
LC34-BW0003D-045.5-20120215	2/15/2012	1340	-022	W	14	3	1	1	3		6				QC - MEEs
LC34-BW0003E-052.5-20120215	2/15/2012	1427	-023	W	11	3	1	1	3		3				
LC34-BW0003F-059.5-20120215	2/15/2012	1503	-024	W	11	3	1	1	3		3				
LC34-IW00021-027.5-20120215	2/15/2012	1353	-025	W	16	3	1	1	3	1	3	2	1	1	QC - Anions
LC34-IW0070D-040.5-20120215	2/15/2012	1210	-026	W	6	3			3						

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD


RECEIVED BY:
 Signature: [Signature]
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 2/15/12 - 1636

REINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 2/15/12 - 1636

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Latour
 Firm: AKS
 Date/Time: 2/16/12 1110

Comments/Special Instructions:
 Please filter dissolved metals in lab.
 3 Coolers

R1201031
 Geosyntec Consultants
 ESTCP PED LC34 2/14-16/12

Barcode: 

58276

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5180 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repta Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-IW0070D1-070.0-20120215	2/15/2012	1138	-029	W	6	3			3						
LC34-IW0071D-040.5-20120215	2/15/2012	1058	-029	W	9	6			3						QC - VOCs
LC34-IW0076-075.0-20120215	2/15/2012	1453	-030, 031	W	12	3	1	1	3		3			1	
LC34-FD-20120215-01	2/15/2012	NA	-032	W	3						3				
LC34-FD-20120215-02	2/15/2012	NA	-033	W	1								1		
LC34-FD-20120215-03	2/15/2012	NA	-034	W	1		1								
LC34-TB-20120215-01	2/15/2012	NA	-035	W	3	3									
LC34-TB-20120215-01	2/15/2012	NA	-036	W	3	3									
LC34-TB-20120215-01	2/15/2012	NA	-037	W	3	3									
					0	0									

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: TR0272A

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

RECEIVED BY:
 Signature: [Signature]
 Printed Name: JOSEPH PORTER
 Firm: GEOSYNTEC
 Date/Time: 2/15/12 - 1630

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: ESTCP
 Firm: ESTCP
 Date/Time: 2/15/12 - 1630

Comments/Special Instructions:
 Please filter dissolved metals in lab.
 3 coolers

R1201031
 Geosyntec Consultants
 ESTCP PED LC34 2/14-16/12

RECEIVED BY:
 Signature: [Signature]
 Printed Name: ESTCP
 Firm: ESTCP
 Date/Time: 2/16/12 110

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____



Cooler Receipt and Preservation Check Form

R1201031

GeoSyntec Consultants
ESTCP PED LC34 2/14-16/12



Project/Client GeoSyntec Folder Number R12-1031

Cooler received on 2/16/12 by: AP COURIER: ALS UPS. FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/ROC, CLIENT
 - Temperature of cooler(s) upon receipt: 3.2° 2.3° 2.9°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes No
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/16/12 1118

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>R-002</u>	by	<u>AP</u>	on	<u>2/16/12</u>	at	<u>1133</u>
5035 samples placed in storage location		by		on		at	

PC Secondary Review: 2/16/12 KB

Cooler Breakdown: Date: 2/16/12 Time: 1422 by: shw

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≈2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC1031936</u>	<u>1/13</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103210F</u>	<u>10/12</u>				
	HCl	*	*	<u>4111060</u>	<u>1/13</u>				

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 1-194-002, 1-280-002, 12121-26X, 060611-1W, 062711-2E

Other Comments:

Temp Blank vial seal broken

Bubbles = BW0003C - sulfide + alkalinity

BW0003A - (2) RSK-175 vial

BW0003E - (1) 8260 vial

FD-20/20215-01 - (1) RSK-175 vial

BW0003F - (1) RSK-175 vial

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

BW0003D - (1) RSK-175 vial

PC Secondary Review: KB 3/16/12

H:\SMODOCS\Cooler Receipt 5.doc

00272

Columbia Analytical Services
 1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380, FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Repla Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX:
 Sampler's Signature: *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-BW0001A-024.5-20120216	2/16/2012	0839	-038, 039	W	16	3	1	1	3	1	3	1	1	1	QC - Anions
LC34-BW0001B-031.5-20120216	2/16/2012	0924	-040, 041, 042	W	16	3	1	1	3	1	3	1	1	2	QC - Dissolved Metals
LC34-BW0001C-038.5-20120216	2/16/2012	1005	-042, 043	W	15	3	1	1	3	1	3	1	1	1	
LC34-BW0001D-045.5-20120216	2/16/2012	1211	-044, 045	W	15	3	1	1	3	1	3	1	1	1	
LC34-BW0001E-052.5-20120216	2/16/2012	1419	-046, 047	W	15	3	1	1	3	1	3	1	1	1	
LC34-BW0001F-059.5-20120216	2/16/2012	1103	-048, 049	W	15	3	1	1	3	1	3	1	1	1	
LC34-IW0002D-037.5-20120216	2/16/2012	1419	-050, 051	W	15	3	1	1	3	1	3	1	1	1	
LC34-IW0002D1-052.5-20120216	2/16/2012	1333	-052, 053	W	18	6	1	1	3	1	3	1	1	1	QC - VOCs

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup, MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY: *[Signature]*
 Signature: *[Signature]*
 Printed Name: Joseph B. Bartlett
 Firm: Geosyntec
 Date/Time: 2/16/12 - 1630

RECEIVED BY: *[Signature]*
 Signature: *[Signature]*
 Printed Name: *[Name]*
 Firm: *[Firm]*
 Date/Time: _____

Comments/Special Instructions:
 Please filter dissolved metals in lab.
 3 coolers
 11:36 am per client per 2/16/12



Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: TR0272A
 Project Manager: Cory Reda Company: Geosyntec Consultants
 Company/Address: 130 Research Lane, Suite 2 Phone: 519-822-2230
 City, State, Zip: Guelph, ON, N1G 5G3 FAX: _____
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Anions (300.0)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-FD-20120216-01	2/16/2012	NA	-054	W	3				3						
LC34-FD-20120216-02	2/16/2012	NA	-055	W	1					1					
LC34-FD-20120216-03	2/16/2012	NA	-056	W	1			1							
LC34-IDW-185539-20120216	2/16/2012	NA	-057	W	3										
LC34-TB-20120216-01	2/16/2012	NA	-058	W	3										

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Joseph Barrett
 Firm: Geosyntec
 Date/Time: 2/16/12-1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: PTO
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Comments/Special Instructions:
 Please filter dissolved metals in lab.
 3 coolers

R1201031
 Geosyntec Consultants
 ESTCP PED LC34 2/14-6/12


RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory Latham
 Firm: AS
 Date/Time: 2/17/12 1022



Cooler Receipt and Preservation Check Form

R1201031
GeoSyntec Consultants
ESTCP PED LC34 2/14-16/12



Project/Client Geosyntec Folder Number R1201031

Cooler received on 2/17/12 by: AP COURIER: ALS UPS. FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/ROO, CLIENT
 - Temperature of cooler(s) upon receipt: 59° 47° 46°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 2/17/12 1004

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>R-002</u>	by	<u>AP</u>	on	<u>2/17/12</u>	at	<u>1016</u>
5035 samples placed in storage location		by		on		at	

PC Secondary Review: AS 2/1/12

Cooler Breakdown: Date: 2/17/12 Time: 1130 by: AP

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? AP 2/17/12 ~~YES~~ NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: BW001E missing, BW001C provided w/ wrong sample temp

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH			<u>WC103138C</u>	<u>1/13</u>				
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC103193G</u>	<u>1/13</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis -- pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-	<u>WC103210F</u>	<u>10/12</u>				
	HCl	*	*	<u>4111010</u>	<u>1/13</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust:

Bottle lot numbers: 062711-27, 1-194-002, 060611-1W, 121211-2XX, 1-286-002

Other Comments: Bubbles - alkalinity + sulfide = all
VOA = 1W000201 (1 vial)

PC Secondary Review: CB 3/6/12

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



April 02, 2012

Service Request No: R1201733

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 FO0510B 3/15/12

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on March 16, 2012. For your reference, these analyses have been assigned our service request number **R1201733**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 15



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272A 3/15/12
Sample Matrix: Water

Service Request No.: R1201733
Date Received: 3/16/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 3/15/12 and were received for analysis at Columbia Analytical Services on 3/16/12 via a national courier. The samples were received at a cooler temperature of 1.5°C within the guidelines of 0-6°C. A Trip Blank was received but not analyzed as per client instructions.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for %D which was outside the 20% limit for N-Butanol on the 3/22/12 run. Any hits for this compound on the associated run should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

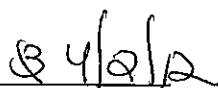
The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date



00002

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1201733

<u>Lab ID</u>	<u>Client ID</u>
R1201733-001	LC34-RW0007-038.5-20120315
R1201733-002	LC34-RW0008-052.0-20120315

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
AZLA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: 3/15/12 1406
Date Received: 3/16/12
Date Analyzed: 3/22/12 12:19

Sample Name: LC34-RW0007-038.5-20120315
Lab Code: R1201733-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\032212\D9054.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	5.8	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	5.0	
79-00-5	1,1,2-Trichloroethane	130	U	130	5.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	870		130	7.8	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	6.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	
106-93-4	1,2-Dibromoethane	130	U	130	5.0	
95-50-1	1,2-Dichlorobenzene	130	U	130	5.0	
107-06-2	1,2-Dichloroethane	130	U	130	5.0	
78-87-5	1,2-Dichloropropane	130	U	130	7.1	
541-73-1	1,3-Dichlorobenzene	130	U	130	5.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	5.0	
71-36-3	n-Butanol	6300	U	6300	270	
78-93-3	2-Butanone (MEK)	250	U	250	13	
591-78-6	2-Hexanone	250	U	250	8.8	
108-10-1	4-Methyl-2-pentanone	250	U	250	6.8	
67-64-1	Acetone	250	U	250	25	
71-43-2	Benzene	130	U	130	5.3	
75-27-4	Bromodichloromethane	130	U	130	5.0	
75-25-2	Bromoform	130	U	130	6.8	
74-83-9	Bromomethane	130	U	130	7.8	
75-15-0	Carbon Disulfide	8.0	I	250	5.0	
56-23-5	Carbon Tetrachloride	130	U	130	6.8	
108-90-7	Chlorobenzene	130	U	130	5.0	
75-00-3	Chloroethane	130	U	130	7.8	
67-66-3	Chloroform	130	U	130	5.5	
74-87-3	Chloromethane	130	U	130	6.0	
110-82-7	Cyclohexane	250	U	250	6.0	
124-48-1	Dibromochloromethane	130	U	130	5.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	15	
75-09-2	Dichloromethane	130	U	130	5.5	
100-41-4	Ethylbenzene	130	U	130	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: 3/15/12 1406
Date Received: 3/16/12
Date Analyzed: 3/22/12 12:19

Sample Name: LC34-RW0007-038.5-20120315
Lab Code: R1201733-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\032212\D9054.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	130	U	130	5.0	
79-20-9	Methyl Acetate	250	U	250	5.8	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	5.0	
108-87-2	Methylcyclohexane	250	U	250	6.3	
100-42-5	Styrene	130	U	130	5.0	
127-18-4	Tetrachloroethene (PCE)	130	U	130	5.0	
108-88-3	Toluene	130	U	130	5.0	
79-01-6	Trichloroethene (TCE)	120	I	130	5.8	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	5.0	
75-01-4	Vinyl Chloride	3000		130	5.8	
156-59-2	cis-1,2-Dichloroethene	3600		130	5.0	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	5.0	
179601-23-1	m,p-Xylenes	130	U	130	5.0	
123-86-4	n-Butyl Acetate	130	U	130	5.3	
95-47-6	o-Xylene	130	U	130	5.0	
156-60-5	trans-1,2-Dichloroethene	160		130	5.0	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	3/22/12 12:19	
Dibromofluoromethane	112	89-119	3/22/12 12:19	
Toluene-d8	106	87-121	3/22/12 12:19	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: 3/15/12 1431
Date Received: 3/16/12
Date Analyzed: 3/22/12 12:49

Sample Name: LC34-RW0008-052.0-20120315
Lab Code: R1201733-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\032212\D9055.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50	U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1100		50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	I	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	3.8	
106-93-4	1,2-Dibromoethane	50	U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.0	
107-06-2	1,2-Dichloroethane	50	U	50	2.0	
78-87-5	1,2-Dichloropropane	50	U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	2500	U	2500	110	
78-93-3	2-Butanone (MEK)	100	U	100	5.1	
591-78-6	2-Hexanone	100	U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100	U	100	2.7	
67-64-1	Acetone	100	U	100	9.8	
71-43-2	Benzene	50	U	50	2.1	
75-27-4	Bromodichloromethane	50	U	50	2.0	
75-25-2	Bromoform	50	U	50	2.7	
74-83-9	Bromomethane	50	U	50	3.1	
75-15-0	Carbon Disulfide	100	U	100	2.0	
56-23-5	Carbon Tetrachloride	50	U	50	2.7	
108-90-7	Chlorobenzene	50	U	50	2.0	
75-00-3	Chloroethane	4.9	I	50	3.1	
67-66-3	Chloroform	50	U	50	2.2	
74-87-3	Chloromethane	50	U	50	2.4	
110-82-7	Cyclohexane	100	U	100	2.4	
124-48-1	Dibromochloromethane	50	U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	5.7	
75-09-2	Dichloromethane	50	U	50	2.2	
100-41-4	Ethylbenzene	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: 3/15/12 1431
Date Received: 3/16/12
Date Analyzed: 3/22/12 12:49

Sample Name: LC34-RW0008-052.0-20120315
Lab Code: R1201733-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa10\data\032212\D9055.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	620		50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	900		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1100		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	17	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	3/22/12 12:49	
Dibromofluoromethane	112	89-119	3/22/12 12:49	
Toluene-d8	105	87-121	3/22/12 12:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: NA
Date Received: NA
Date Analyzed: 3/22/12 11:49

Sample Name: Method Blank
Lab Code: RQ1202914-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\msvoa10\data\032212\D9053.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Collected: NA
Date Received: NA
Date Analyzed: 3/22/12 11:49

Sample Name: Method Blank
Lab Code: RQ1202914-01

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa10\data\032212\D9053.D\

Analysis Lot: 284464
Instrument Name: R-MS-10
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	3/22/12 11:49	
Dibromofluoromethane	111	89-119	3/22/12 11:49	
Toluene-d8	105	87-121	3/22/12 11:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Analyzed: 3/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 284464

Lab Control Sample
RQ1202914-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.7	20.0	104	72 - 128
1,1,2,2-Tetrachloroethane	21.4	20.0	107	72 - 131
1,1,2-Trichloroethane	20.6	20.0	103	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.1	20.0	101	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.7	20.0	104	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.0	20.0	105	72 - 129
1,2,4-Trichlorobenzene	19.4	20.0	97	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.7	20.0	99	62 - 131
1,2-Dibromoethane	21.7	20.0	108	78 - 125
1,2-Dichlorobenzene	20.3	20.0	102	79 - 124
1,2-Dichloroethane	22.6	20.0	113	73 - 127
1,2-Dichloropropane	21.0	20.0	105	80 - 123
1,3-Dichlorobenzene	20.2	20.0	101	78 - 124
1,4-Dichlorobenzene	19.9	20.0	100	78 - 123
n-Butanol	798	1000	80	70 - 130
2-Butanone (MEK)	19.9	20.0	100	60 - 133
2-Hexanone	20.6	20.0	103	61 - 131
4-Methyl-2-pentanone	19.7	20.0	98	61 - 132
Acetone	18.5	20.0	92	54 - 139
Benzene	21.6	20.0	108	78 - 121
Bromodichloromethane	22.8	20.0	114	80 - 125
Bromoform	22.8	20.0	114	68 - 130
Bromomethane	19.9	20.0	99	57 - 144
Carbon Disulfide	23.8	20.0	119	52 - 140
Carbon Tetrachloride	23.3	20.0	116	68 - 133
Chlorobenzene	21.6	20.0	108	80 - 121
Chloroethane	20.9	20.0	105	71 - 130
Chloroform	21.8	20.0	109	78 - 125
Chloromethane	21.8	20.0	109	61 - 138
Cyclohexane	19.1	20.0	95	57 - 126
Dibromochloromethane	23.4	20.0	117	78 - 133
Dichlorodifluoromethane (CFC 12)	23.5	20.0	118	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0510B 3/15/12
Sample Matrix: Water

Service Request: R1201733
Date Analyzed: 3/22/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 284464

**Lab Control Sample
 RQ1202914-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.1	20.0	105	75 - 125
Ethylbenzene	21.0	20.0	105	78 - 123
Isopropylbenzene (Cumene)	21.1	20.0	105	73 - 133
Methyl Acetate	20.0	20.0	100	57 - 157
Methyl tert-Butyl Ether	19.3	20.0	97	75 - 126
Methylcyclohexane	17.8	20.0	89	61 - 125
Styrene	20.2	20.0	101	80 - 132
Tetrachloroethene (PCE)	22.7	20.0	113	72 - 131
Toluene	21.2	20.0	106	78 - 122
Trichloroethene (TCE)	20.3	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	24.5	20.0	122	69 - 141
Vinyl Chloride	20.9	20.0	104	72 - 138
cis-1,2-Dichloroethene	19.7	20.0	98	78 - 122
cis-1,3-Dichloropropene	19.8	20.0	99	77 - 125
m,p-Xylenes	43.3	40.0	108	79 - 126
n-Butyl Acetate	17.1	20.0	86	31 - 144
o-Xylene	21.0	20.0	105	77 - 118
trans-1,2-Dichloroethene	20.1	20.0	100	75 - 121
trans-1,3-Dichloropropene	20.2	20.0	101	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0510B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Ste. 3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813

Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEFs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
LC34-RW0007-038.5-20120315	3/15/2012	1406	-001	W	3	3								
LC34-RW0008-052.0-20120315	3/15/2012	1431	-002	W	3	3								
LC34-TB-20120315	3/15/2012	NA	-003	W	3	3								

Comments/Special Instructions:

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

Invoice Information
 P.O. # _____
 Bill to: FO0510B

R1201733
 GeoSyntec Consultants
 ESTCP PED LC34 FO0510B 3/16/12



TURNAROUND REQUIREMENTS Signature: <u>[Signature]</u> Printed Name: <u>J. BARTRETT</u> Firm: <u>Geosyntec</u> Date/Time: <u>3/15/12-1630</u>	REPORT REQUIREMENTS Signature: <u>[Signature]</u> Printed Name: <u>[Signature]</u> Firm: <u>AKS</u> Date/Time: <u>3/16/12 0940</u>
---	---



Cooler Receipt and Preservation Check Form

Project/Client Acrosyntec Folder Number R1201733

Cooler received on 3/16/12 by: AP COURIER: ALS UPS ~~FEDEX~~ VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc.)? ~~YES~~ NO
- Did all bottles arrive in good condition (unbroken)? ~~YES~~ NO
- Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
- Were Ice or Ice packs present? ~~YES~~ NO
- Where did the bottles originate? ALS/ROD, CLIENT
- Temperature of cooler(s) upon receipt: 15°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 3/16/12 0949

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location R-012 by AP on 3/16/12 at 0950
 5035 samples placed in storage location by _____ on _____ at _____

PC Secondary Review: AP 3/16/12

Cooler Breakdown: Date: 3/16/12 Time: 1244 by: AP

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? ~~YES~~ NO
- Did all bottle labels and tags agree with custody papers? ~~YES~~ NO
- Were correct containers used for the tests indicated? ~~YES~~ NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 1-286-002

Other Comments: _____

PC Secondary Review: W. Bulala
 H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



May 07, 2012

Service Request No: R1202512

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 FO552B (4/19/12)

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on April 20, 2012. For your reference, these analyses have been assigned our service request number **R1202512**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

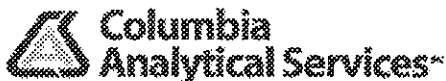
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 15



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1202512

Lab ID
R1202512-001
R1202512-002

Client ID
LC34-RW0007-038.5-20120419
LC34-RW0008-052.0-20120419

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (4/19/12)
Sample Matrix: Water

Service Request No.: R1202512
Date Received: 4/20/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 4/19/12 and were received for analysis at Columbia Analytical Services from 4/20/12 via a national courier. The samples were received at a cooler temperature of 7.1°C slightly above the guidelines of 0-6°C. Ice was present in the cooler with the samples and the temperature was noted on the sample confirmation. The chain of custody forms were consistent with the samples received.

Volatile Organic Compounds GC/MS

Thirty-eight (38) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for %D which was outside the 20% limit for the following compounds: Methyl Acetate, MTBE, and 2-Butanone on the 4/24/12 run. Any hits for these compounds on the associated runs should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for a low level hit of Bromomethane on the 4/24/12 blank. No data was affected.

No other analytical or QC problems were encountered.

Approved by



Date



00003

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120419
Lab Code: R1202512-001

Service Request: R1202512
Date Collected: 4/19/12 1112
Date Received: 4/20/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	130	U	130	5.8	25	NA	4/24/12 13:07		288728	
1,1,2,2-Tetrachloroethane	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,1,2-Trichloroethane	130	U	130	5.8	25	NA	4/24/12 13:07		288728	
1,1,2-Trichloro-1,2,2-trifluoroethane	8200		250	16	50	NA	4/24/12 14:13		288728	
1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	25	NA	4/24/12 13:07		288728	
1,2,4-Trichlorobenzene	130	U	130	6.5	25	NA	4/24/12 13:07		288728	
1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	25	NA	4/24/12 13:07		288728	
1,2-Dibromoethane	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,2-Dichlorobenzene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,2-Dichloroethane	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,2-Dichloropropane	130	U	130	7.1	25	NA	4/24/12 13:07		288728	
1,3-Dichlorobenzene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
1,4-Dichlorobenzene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
n-Butanol	6300	U	6300	270	25	NA	4/24/12 13:07		288728	
2-Butanone (MEK)	250	U	250	13	25	NA	4/24/12 13:07		288728	
2-Hexanone	250	U	250	8.8	25	NA	4/24/12 13:07		288728	
4-Methyl-2-pentanone	250	U	250	6.8	25	NA	4/24/12 13:07		288728	
Acetone	250	U	250	25	25	NA	4/24/12 13:07		288728	
Benzene	130	U	130	5.3	25	NA	4/24/12 13:07		288728	
Bromodichloromethane	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Bromoform	130	U	130	6.8	25	NA	4/24/12 13:07		288728	
Bromomethane	130	U	130	7.8	25	NA	4/24/12 13:07		288728	
Carbon Disulfide	9.0	I	250	5.0	25	NA	4/24/12 13:07		288728	
Carbon Tetrachloride	130	U	130	6.8	25	NA	4/24/12 13:07		288728	
Chlorobenzene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Chloroethane	130	U	130	7.8	25	NA	4/24/12 13:07		288728	
Chloroform	130	U	130	5.5	25	NA	4/24/12 13:07		288728	
Chloromethane	130	U	130	6.0	25	NA	4/24/12 13:07		288728	
Cyclohexane	250	U	250	6.0	25	NA	4/24/12 13:07		288728	
Dibromochloromethane	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Dichlorodifluoromethane (CFC 12)	130	U	130	15	25	NA	4/24/12 13:07		288728	
Dichloromethane	130	U	130	5.5	25	NA	4/24/12 13:07		288728	
Ethylbenzene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Isopropylbenzene (Cumene)	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Methyl Acetate	250	U	250	5.8	25	NA	4/24/12 13:07		288728	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120419
Lab Code: R1202512-001

Service Request: R1202512
Date Collected: 4/19/12 1112
Date Received: 4/20/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Methylcyclohexane	250	U	250	6.3	25	NA	4/24/12 13:07		288728	
Styrene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Tetrachloroethene (PCE)	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Toluene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Trichloroethene (TCE)	650		130	5.8	25	NA	4/24/12 13:07		288728	
Trichlorofluoromethane (CFC 11)	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
Vinyl Chloride	8100		250	12	50	NA	4/24/12 14:13		288728	
cis-1,2-Dichloroethene	7200		250	10	50	NA	4/24/12 14:13		288728	
cis-1,3-Dichloropropene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
m,p-Xylenes	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
n-Butyl Acetate	130	U	130	5.3	25	NA	4/24/12 13:07		288728	
o-Xylene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	
trans-1,2-Dichloroethene	200		130	5.0	25	NA	4/24/12 13:07		288728	
trans-1,3-Dichloropropene	130	U	130	5.0	25	NA	4/24/12 13:07		288728	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	4/24/12 13:07	
Dibromofluoromethane	104	89-119	4/24/12 13:07	
Toluene-d8	99	87-121	4/24/12 13:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Collected: 4/19/12 1141
Date Received: 4/20/12
Date Analyzed: 4/24/12 13:40

Sample Name: LC34-RW0008-052.0-20120419
Lab Code: R1202512-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\042412\U8141.D\

Analysis Lot: 288728
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	670	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50 U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	100 U	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	50 U	50	3.1	
75-15-0	Carbon Disulfide	6.7 I	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	50 U	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Collected: 4/19/12 1141
Date Received: 4/20/12
Date Analyzed: 4/24/12 13:40

Sample Name: LC34-RW0008-052.0-20120419
Lab Code: R1202512-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\042412\U8141.D\

Analysis Lot: 288728
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50 U	50	2.0	
79-20-9	Methyl Acetate	100 U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50 U	50	2.0	
108-87-2	Methylcyclohexane	100 U	100	2.5	
100-42-5	Styrene	50 U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50 U	50	2.0	
108-88-3	Toluene	50 U	50	2.0	
79-01-6	Trichloroethene (TCE)	290	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50 U	50	2.0	
75-01-4	Vinyl Chloride	1100	50	2.4	
156-59-2	cis-1,2-Dichloroethene	870	50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50 U	50	2.0	
179601-23-1	m,p-Xylenes	50 U	50	2.0	
123-86-4	n-Butyl Acetate	50 U	50	2.1	
95-47-6	o-Xylene	50 U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	17 I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50 U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	4/24/12 13:40	
Dibromofluoromethane	101	89-119	4/24/12 13:40	
Toluene-d8	98	87-121	4/24/12 13:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Collected: NA
Date Received: NA
Date Analyzed: 4/24/12 12:34

Sample Name: Method Blank
Lab Code: RQ1204146-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\042412\U8139.D\

Analysis Lot: 288728
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	0.46 I	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Collected: NA
Date Received: NA
Date Analyzed: 4/24/12 12:34

Sample Name: Method Blank
Lab Code: RQ1204146-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\042412\U8139.D\

Analysis Lot: 288728
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	4/24/12 12:34	
Dibromofluoromethane	100	89-119	4/24/12 12:34	
Toluene-d8	98	87-121	4/24/12 12:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Analyzed: 4/24/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 288728

Lab Control Sample
RQ1204146-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.6	20.0	83	72 - 128
1,1,2,2-Tetrachloroethane	19.7	20.0	98	72 - 131
1,1,2-Trichloroethane	20.1	20.0	101	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	14.4	20.0	72	68 - 136
1,1-Dichloroethane (1,1-DCA)	16.9	20.0	85	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.0	20.0	85	72 - 129
1,2,4-Trichlorobenzene	19.8	20.0	99	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	21.4	20.0	107	62 - 131
1,2-Dibromoethane	19.9	20.0	99	78 - 125
1,2-Dichlorobenzene	19.3	20.0	96	79 - 124
1,2-Dichloroethane	20.1	20.0	101	73 - 127
1,2-Dichloropropane	17.6	20.0	88	80 - 123
1,3-Dichlorobenzene	18.8	20.0	94	78 - 124
1,4-Dichlorobenzene	18.5	20.0	92	78 - 123
n-Butanol	895	1010	89	70 - 130
2-Butanone (MEK)	15.4	20.0	77	60 - 133
2-Hexanone	18.6	20.0	93	61 - 131
4-Methyl-2-pentanone	18.5	20.0	92	61 - 132
Acetone	17.2	20.0	86	54 - 139
Benzene	17.3	20.0	86	78 - 121
Bromodichloromethane	19.8	20.0	99	80 - 125
Bromoform	22.3	20.0	111	68 - 130
Bromomethane	16.1	20.0	80	57 - 144
Carbon Disulfide	18.9	20.0	94	52 - 140
Carbon Tetrachloride	19.1	20.0	96	68 - 133
Chlorobenzene	18.5	20.0	92	80 - 121
Chloroethane	17.9	20.0	90	71 - 130
Chloroform	18.2	20.0	91	78 - 125
Chloromethane	17.0	20.0	85	61 - 138
Cyclohexane	19.3	20.0	96	57 - 126
Dibromochloromethane	22.0	20.0	110	78 - 133
Dichlorodifluoromethane (CFC 12)	18.8	20.0	94	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO552B (4/19/12)
Sample Matrix: Water

Service Request: R1202512
Date Analyzed: 4/24/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 288728

Lab Control Sample
RQ1204146-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	17.5	20.0	88	75 - 125
Ethylbenzene	17.3	20.0	87	78 - 123
Isopropylbenzene (Cumene)	17.8	20.0	89	73 - 133
Methyl Acetate	18.9	20.0	94	57 - 157
Methyl tert-Butyl Ether	23.1	20.0	116	75 - 126
Methylcyclohexane	20.0	20.0	100	61 - 125
Styrene	18.9	20.0	95	80 - 132
Tetrachloroethene (PCE)	17.4	20.0	87	72 - 131
Toluene	17.7	20.0	89	78 - 122
Trichloroethene (TCE)	18.0	20.0	90	74 - 127
Trichlorofluoromethane (CFC 11)	17.0	20.0	85	69 - 141
Vinyl Chloride	17.1	20.0	85	72 - 138
cis-1,2-Dichloroethene	18.0	20.0	90	78 - 122
cis-1,3-Dichloropropene	18.6	20.0	93	77 - 125
m,p-Xylenes	35.3	40.0	88	79 - 126
n-Butyl Acetate	20.5	20.0	102	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	16.6	20.0	83	75 - 121
trans-1,3-Dichloropropene	19.7	20.0	99	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Ste. 3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: *[Signature]*

Analysis Requested

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
3	3								
3	3								

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-RW0007-038.5-20120419	4/19/2012	1112	001	W
LC34-RW0008-052.0-20120419	4/19/2012	1141	002	W


TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

5

R1202512

Geosyntec Consultants
 ESTCP PED LC34 FO552B (4/19/12)



RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: J. BARTLETT
 Firm: GEOSYNTEC CONSULTANTS
 Date/Time: 4/19/12 - 1630

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Rebecca Daprato
 Firm: _____
 Date/Time: 4/19/12 - 1630

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Daniel W/12
 Firm: ALS
 Date/Time: 4/20/12 / 1025



Cooler Receipt and Preservation Check Form

Project/Client Geosyntec Folder Number R1202512

Cooler received on 4/20/12 by: slw COURIER: ALS UPS ~~FEDEX~~ VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were ~~ice~~ or Ice packs present? YES NO
6. Where did the bottles originate? ALS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 7.10

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 4/20/12 / 1035

Thermometer ID: IR GUN#3 / IR ~~GUN#4~~ Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>4/20/12</u>	by <u>slw</u>	on <u>4/20/12</u>	at <u>1040</u>
5035 samples placed in storage location		by	on	at

PC Secondary Review: KB 4/20/12

Cooler Breakdown: Date: 4/20/12 Time: 1149 by: slw

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies:

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*						

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust:

Bottle lot numbers: 1-286-002

Other Comments:

PC Secondary Review: KB 5/7/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

00015



June 05, 2012

Service Request No: R1203201

Mr. Cory Repta
GeoSyntec Consultants
130 Research Lane
Suite 2
Guelph, ON N1G 5G3
CANADA

Laboratory Results for: ESTCP PED LC34 FO0552B 5/17/12

Dear Mr. Repta:

Enclosed are the results of the sample(s) submitted to our laboratory on May 18, 2012. For your reference, these analyses have been assigned our service request number **R1203201**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

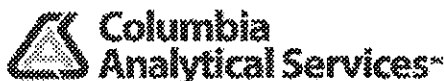
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at KBunker@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 19



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company



PROJECT WQ/LE/RES/12: PROJECT MANAGER

00001

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (5/17/12)
Sample Matrix: Water

Service Request No.: R1203201
Date Received: 5/18/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 5/17/12 and were received for analysis at Columbia Analytical Services from 5/18/12 via a national courier. The samples were received at a cooler temperature of 4.1°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C.

Initial and Continuing Calibration Criteria was met for all samples except for %D which was outside the 20% limit for the following compounds: Bromoform, Chloromethane, and Dichlorodifluoromethane on the 5/21/12 run and 2-Butanone, Acetone, and Dichlorodifluoromethane on the 5/22/12 analytical run. Any hits for these compounds on the associated runs should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

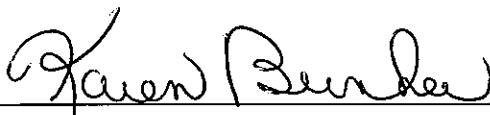
All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for a low level hit of 1,2,4-Trichlorobenzene, Bromomethane, Dichloromethane on the 5/22/12 (analysis 292528) blank and 1,2,4-Trichlorobenzene and Bromomethane (analysis 292718). No data was affected.

No other analytical or QC problems were encountered.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1203201

<u>Lab ID</u>	<u>Client ID</u>
R1203201-001	LC34-RW0007-038.5-20120517
R1203201-002	LC34-RW0008-052.0-20120517

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120517
Lab Code: R1203201-001

Service Request: R1203201
Date Collected: 5/17/12 0854
Date Received: 5/18/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	12	50	NA	5/22/12 03:01		292528	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,1,2-Trichloroethane	250	U	250	12	50	NA	5/22/12 03:01		292528	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		500	31	100	NA	5/22/12 13:28		292718	
1,1-Dichloroethane (1,1-DCA)	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,1-Dichloroethene (1,1-DCE)	250	U	250	15	50	NA	5/22/12 03:01		292528	
1,2,4-Trichlorobenzene	250	U	250	13	50	NA	5/22/12 03:01		292528	
1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	50	NA	5/22/12 03:01		292528	
1,2-Dibromoethane	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,2-Dichlorobenzene	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,2-Dichloroethane	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,2-Dichloropropane	250	U	250	15	50	NA	5/22/12 03:01		292528	
1,3-Dichlorobenzene	250	U	250	10	50	NA	5/22/12 03:01		292528	
1,4-Dichlorobenzene	250	U	250	10	50	NA	5/22/12 03:01		292528	
n-Butanol	13000	U	13000	530	50	NA	5/22/12 03:01		292528	
2-Butanone (MEK)	500	U	500	26	50	NA	5/22/12 03:01		292528	
2-Hexanone	500	U	500	18	50	NA	5/22/12 03:01		292528	
4-Methyl-2-pentanone	500	U	500	14	50	NA	5/22/12 03:01		292528	
Acetone	500	U	500	49	50	NA	5/22/12 03:01		292528	
Benzene	250	U	250	11	50	NA	5/22/12 03:01		292528	
Bromodichloromethane	250	U	250	10	50	NA	5/22/12 03:01		292528	
Bromoform	250	U	250	14	50	NA	5/22/12 03:01		292528	
Bromomethane	29	I	250	16	50	NA	5/22/12 03:01		292528	
Carbon Disulfide	33	I	500	10	50	NA	5/22/12 03:01		292528	
Carbon Tetrachloride	250	U	250	14	50	NA	5/22/12 03:01		292528	
Chlorobenzene	250	U	250	10	50	NA	5/22/12 03:01		292528	
Chloroethane	250	U	250	16	50	NA	5/22/12 03:01		292528	
Chloroform	250	U	250	11	50	NA	5/22/12 03:01		292528	
Chloromethane	250	U	250	12	50	NA	5/22/12 03:01		292528	
Cyclohexane	500	U	500	12	50	NA	5/22/12 03:01		292528	
Dibromochloromethane	250	U	250	10	50	NA	5/22/12 03:01		292528	
Dichlorodifluoromethane (CFC 12)	250	U	250	29	50	NA	5/22/12 03:01		292528	
Dichloromethane	250	U	250	11	50	NA	5/22/12 03:01		292528	
Ethylbenzene	250	U	250	10	50	NA	5/22/12 03:01		292528	
Isopropylbenzene (Cumene)	250	U	250	10	50	NA	5/22/12 03:01		292528	
Methyl Acetate	500	U	500	12	50	NA	5/22/12 03:01		292528	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120517
Lab Code: R1203201-001

Service Request: R1203201
Date Collected: 5/17/12 0854
Date Received: 5/18/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	250	U	250	10	50	NA	5/22/12 03:01		292528	
Methylcyclohexane	500	U	500	13	50	NA	5/22/12 03:01		292528	
Styrene	250	U	250	10	50	NA	5/22/12 03:01		292528	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	5/22/12 03:01		292528	
Toluene	250	U	250	10	50	NA	5/22/12 03:01		292528	
Trichloroethene (TCE)	520		250	12	50	NA	5/22/12 03:01		292528	
Trichlorofluoromethane (CFC 11)	250	U	250	10	50	NA	5/22/12 03:01		292528	
Vinyl Chloride	8700		250	12	50	NA	5/22/12 03:01		292528	
cis-1,2-Dichloroethene	6000		250	10	50	NA	5/22/12 03:01		292528	
cis-1,3-Dichloropropene	250	U	250	10	50	NA	5/22/12 03:01		292528	
m,p-Xylenes	250	U	250	10	50	NA	5/22/12 03:01		292528	
n-Butyl Acetate	250	U	250	11	50	NA	5/22/12 03:01		292528	
o-Xylene	250	U	250	10	50	NA	5/22/12 03:01		292528	
trans-1,2-Dichloroethene	190	I	250	10	50	NA	5/22/12 03:01		292528	
trans-1,3-Dichloropropene	250	U	250	10	50	NA	5/22/12 03:01		292528	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	92	85-122	5/22/12 03:01	
Dibromofluoromethane	94	89-119	5/22/12 03:01	
Toluene-d8	96	87-121	5/22/12 03:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: 5/17/12 0916
Date Received: 5/18/12
Date Analyzed: 5/22/12 03:34

Sample Name: LC34-RW0008-052.0-20120517
Lab Code: R1203201-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA12\DATA\052112\U8971.D\

Analysis Lot: 292528
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1100	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50 U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	100 U	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	6.1 I	50	3.1	
75-15-0	Carbon Disulfide	12 I	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	2.9 I	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: 5/17/12 0916
Date Received: 5/18/12
Date Analyzed: 5/22/12 03:34

Sample Name: LC34-RW0008-052.0-20120517
Lab Code: R1203201-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\052112\U8971.D\

Analysis Lot: 292528
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	300		50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	870		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1300		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	18	I	50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	5/22/12 03:34	
Dibromofluoromethane	96	89-119	5/22/12 03:34	
Toluene-d8	99	87-121	5/22/12 03:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: NA
Date Received: NA
Date Analyzed: 5/22/12 00:16

Sample Name: Method Blank
Lab Code: RQ1205582-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\052112\U8965.D\

Analysis Lot: 292528
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.28 I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	0.88 I	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	0.22 I	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: NA
Date Received: NA
Date Analyzed: 5/22/12 00:16

Sample Name: Method Blank
Lab Code: RQ1205582-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA12\DATA\052112\U8965.D\

Analysis Lot: 292528
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	5/22/12 00:16	
Dibromofluoromethane	96	89-119	5/22/12 00:16	
Toluene-d8	96	87-121	5/22/12 00:16	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: NA
Date Received: NA
Date Analyzed: 5/22/12 12:55

Sample Name: Method Blank
Lab Code: RQ1205892-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\052212\U8988.D\

Analysis Lot: 292718
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.32 I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	0.81 I	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Collected: NA
Date Received: NA
Date Analyzed: 5/22/12 12:55

Sample Name: Method Blank
Lab Code: RQ1205892-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\052212\U8988.D\

Analysis Lot: 292718
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	93	85-122	5/22/12 12:55	
Dibromofluoromethane	95	89-119	5/22/12 12:55	
Toluene-d8	93	87-121	5/22/12 12:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Analyzed: 5/21/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 292528

**Lab Control Sample
 RQ1205582-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.7	20.0	103	72 - 128
1,1,2,2-Tetrachloroethane	20.6	20.0	103	72 - 131
1,1,2-Trichloroethane	19.1	20.0	96	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.3	20.0	96	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.7	20.0	103	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.5	20.0	107	72 - 129
1,2,4-Trichlorobenzene	20.5	20.0	103	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	22.1	20.0	111	62 - 131
1,2-Dibromoethane	20.5	20.0	103	78 - 125
1,2-Dichlorobenzene	20.3	20.0	101	79 - 124
1,2-Dichloroethane	19.5	20.0	98	73 - 127
1,2-Dichloropropane	18.9	20.0	95	80 - 123
1,3-Dichlorobenzene	19.9	20.0	100	78 - 124
1,4-Dichlorobenzene	20.4	20.0	102	78 - 123
n-Butanol	927	1010	92	70 - 130
2-Butanone (MEK)	17.1	20.0	85	60 - 133
2-Hexanone	19.5	20.0	98	61 - 131
4-Methyl-2-pentanone	18.3	20.0	91	61 - 132
Acetone	17.5	20.0	88	54 - 139
Benzene	20.0	20.0	100	78 - 121
Bromodichloromethane	20.0	20.0	100	80 - 125
Bromoform	23.1	20.0	116	68 - 130
Bromomethane	19.2	20.0	96	57 - 144
Carbon Disulfide	21.6	20.0	108	52 - 140
Carbon Tetrachloride	20.9	20.0	104	68 - 133
Chlorobenzene	19.6	20.0	98	80 - 121
Chloroethane	19.8	20.0	99	71 - 130
Chloroform	21.2	20.0	106	78 - 125
Chloromethane	17.7	20.0	89	61 - 138
Cyclohexane	15.4	20.0	77	57 - 126
Dibromochloromethane	20.3	20.0	101	78 - 133
Dichlorodifluoromethane (CFC 12)	19.8	20.0	99	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Analyzed: 5/21/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 292528

Lab Control Sample

RQ1205582-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.7	20.0	98	75 - 125
Ethylbenzene	20.1	20.0	100	78 - 123
Isopropylbenzene (Cumene)	21.3	20.0	106	73 - 133
Methyl Acetate	17.8	20.0	89	57 - 157
Methyl tert-Butyl Ether	18.3	20.0	92	75 - 126
Methylcyclohexane	16.1	20.0	81	61 - 125
Styrene	20.5	20.0	102	80 - 132
Tetrachloroethene (PCE)	18.8	20.0	94	72 - 131
Toluene	19.8	20.0	99	78 - 122
Trichloroethene (TCE)	20.9	20.0	104	74 - 127
Trichlorofluoromethane (CFC 11)	19.7	20.0	98	69 - 141
Vinyl Chloride	18.9	20.0	95	72 - 138
cis-1,2-Dichloroethene	21.0	20.0	105	78 - 122
cis-1,3-Dichloropropene	18.4	20.0	92	77 - 125
m,p-Xylenes	40.2	40.0	100	79 - 126
n-Butyl Acetate	20.9	20.0	105	31 - 144
o-Xylene	20.3	20.0	101	77 - 118
trans-1,2-Dichloroethene	20.8	20.0	104	75 - 121
trans-1,3-Dichloropropene	18.7	20.0	93	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Analyzed: 5/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 292718

Lab Control Sample
RQ1205892-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.2	20.0	101	72 - 128
1,1,2,2-Tetrachloroethane	21.1	20.0	105	72 - 131
1,1,2-Trichloroethane	17.5	20.0	87	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	18.9	20.0	95	68 - 136
1,1-Dichloroethane (1,1-DCA)	19.1	20.0	95	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.7	20.0	104	72 - 129
1,2,4-Trichlorobenzene	23.7	20.0	118	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.4	20.0	92	62 - 131
1,2-Dibromoethane	19.7	20.0	98	78 - 125
1,2-Dichlorobenzene	20.1	20.0	100	79 - 124
1,2-Dichloroethane	19.7	20.0	99	73 - 127
1,2-Dichloropropane	18.4	20.0	92	80 - 123
1,3-Dichlorobenzene	20.3	20.0	102	78 - 124
1,4-Dichlorobenzene	20.2	20.0	101	78 - 123
n-Butanol	786	1010	78	70 - 130
2-Butanone (MEK)	15.0	20.0	75	60 - 133
2-Hexanone	16.6	20.0	83	61 - 131
4-Methyl-2-pentanone	17.3	20.0	86	61 - 132
Acetone	15.5	20.0	78	54 - 139
Benzene	19.9	20.0	100	78 - 121
Bromodichloromethane	19.9	20.0	100	80 - 125
Bromoform	22.5	20.0	112	68 - 130
Bromomethane	20.5	20.0	102	57 - 144
Carbon Disulfide	22.5	20.0	113	52 - 140
Carbon Tetrachloride	21.2	20.0	106	68 - 133
Chlorobenzene	19.4	20.0	97	80 - 121
Chloroethane	19.6	20.0	98	71 - 130
Chloroform	20.0	20.0	100	78 - 125
Chloromethane	17.3	20.0	87	61 - 138
Cyclohexane	17.7	20.0	88	57 - 126
Dibromochloromethane	19.8	20.0	99	78 - 133
Dichlorodifluoromethane (CFC 12)	20.8	20.0	104	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 5/17/12
Sample Matrix: Water

Service Request: R1203201
Date Analyzed: 5/22/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 292718

**Lab Control Sample
 RQ1205892-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	18.8	20.0	94	75 - 125
Ethylbenzene	19.6	20.0	98	78 - 123
Isopropylbenzene (Cumene)	20.9	20.0	104	73 - 133
Methyl Acetate	17.3	20.0	87	57 - 157
Methyl tert-Butyl Ether	17.3	20.0	87	75 - 126
Methylcyclohexane	18.7	20.0	93	61 - 125
Styrene	19.6	20.0	98	80 - 132
Tetrachloroethene (PCE)	17.6	20.0	88	72 - 131
Toluene	19.9	20.0	100	78 - 122
Trichloroethene (TCE)	19.2	20.0	96	74 - 127
Trichlorofluoromethane (CFC 11)	20.7	20.0	103	69 - 141
Vinyl Chloride	19.2	20.0	96	72 - 138
cis-1,2-Dichloroethene	20.4	20.0	102	78 - 122
cis-1,3-Dichloropropene	18.3	20.0	91	77 - 125
m,p-Xylenes	39.4	40.0	98	79 - 126
n-Butyl Acetate	19.0	20.0	95	31 - 144
o-Xylene	19.4	20.0	97	77 - 118
trans-1,2-Dichloroethene	19.7	20.0	99	75 - 121
trans-1,3-Dichloropropene	18.4	20.0	92	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.


Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Ste. 3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: [Signature]

Analysis Requested

Number of Containers	VOCs (8260C) plus n-butyl acetate	VFAs (300)	Bromide and Iodide with Anions (300.0)	TOC (9060A)	Sulfide (9060A)	MEEs (RSK 175)	Alkalinity (310.1)	Dissolved Metals (6010B)	REMARKS
3	3								
3	3								

Comments/Special Instructions:
R1203201
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B 5/17/12

5

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: J. BARRETT
 Firm: Geosyntec
 Date/Time: 5/17/12 - 1630

RECEIVED BY:
 Signature: [Signature]
 Printed Name: AMY HERTSCHKE
 Firm: ALS
 Date/Time: 5/18/12 0955



Cooler Receipt and Preservation Check Form

Project/Client GeoSyntec Folder Number R1203201

Cooler received on 5/18/12 by: ALT COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/ROC CLIENT
 - Temperature of cooler(s) upon receipt: 4.1°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 5/18/12 1005

Thermometer ID: IR GUN#3 IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:
 All Samples held in storage location R-COR by ALT on 5/18/12 at LOW
 5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: AS 5/18/12

Cooler Breakdown: Date: 5/18/12 Time: 1454 by: ALT

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 - Did all bottle labels and tags agree with custody papers? YES NO
 - Were correct containers used for the tests indicated? YES NO
 - Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK
		YES	NO							
≥12	NaOH									No = Samples were preserved at lab as listed
≤2	HNO ₃									
≤2	H ₂ SO ₄									
<4	NaHSO ₄									
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)						PM OK to Adjust: _____
	Na ₂ S ₂ O ₃	-	-							
	Zn Aceta	-	-							
	HCl	*	*							

*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet

Bottle lot numbers: Client
Other Comments: _____

PC Secondary Review: KB 6/5/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



July 13, 2012

Service Request No: R1204087

Dr. Rebecca Daprato
GeoSyntec Consultants
2692 Madison Rd
Suite N1 #223
Cincinnati, OH 45208

Laboratory Results for: ESTCP PED LC34 FO0552B 6/26/12

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on June 27, 2012. For your reference, these analyses have been assigned our service request number **R1204087**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 121



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (6/26/12)
Sample Matrix: Water

Service Request No.: R1204087
Date Received: 6/27/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-four (24) water samples were collected by the client on 6/26/12 and were received for analysis at Columbia Analytical Services on 6/27/12 via a national courier. The samples were received at a cooler temperature range of 2.0-2.6°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received. The

Volatile Organic Compounds GC/MS

Twenty-four (24) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C. Eighteen (18) samples were also analyzed for GC Method RSK-175.

The minimum response factor for Tetrachloroethene was not met in the daily CCV on 6/29/12 (analysis lot #s 2981036 and 298544) runs. The ICAL's were acceptable. The data has been considered acceptable since the MRL's have been verified by the low standard in the calibration.

Continuing Calibration Criteria was met for all samples except for %D which was outside the 20% limit for the following compounds:

1,2-Dibromo-3-chloropropane (23.3%) and Bromoform (30.1%) on the 6/29/12 run,
1,1,2,2-Tetrachloroethane (21.3%), 1,2-Dibromo-3-chloropropane (32.4%), n-Butanol (22.1%), 2-Hexanone (21.9%), Bromoform (36.1%), Dichlorodifluoromethane (23.0%), and n-Butyl Acetate (24.5%) on the 6/30/12 run, and Acetone (-22.4%), Carbon Disulfide (26.4%), and Dichlorodifluoromethane (23.6%) on the 7/2/12 run.

Any hits for these compounds on the associated runs should be considered as estimated, however only the compound N-Butanol was detected in location -009 and this sample was repeated at a dilution on 7/2/12.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits except for Bromoform (LCS only) and 1,1,2,2-Tetrachloroethane (LCS only) on the 6/29/12, and Carbon Disulfide on the 7/2/12 run.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for a low level hit of 1,24-Trichlorobenzene on the 6/29/12, 6/30/12, and 7/2/12 blanks. Any affected data has been flagged as "B".

No other analytical or QC problems were encountered.

Approved by Kevin Bunker Date 7/13/12

Eighteen (18) water samples were analyzed for TOC analysis by method 9060A.

All initial and continuing calibration criteria were met.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within acceptance limits.

All Method Blanks were free from contamination.

All samples were analyzed within the proper holding time.

No problems were encountered during the analysis of these samples.

Approved by Kevin Beuler Date 7/13/12

CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1204087

<u>Lab ID</u>	<u>Client ID</u>
R1204087-001	LC34-IW0070D-040.5-20120626
R1204087-002	LC34-IW0070D1-070.0-20120626
R1204087-003	LC34-IW0071D-040.5-20120626
R1204087-004	LC34-IW0071D1-070.0-20120626
R1204087-005	LC34-BW0002C-038.5-20120626
R1204087-006	LC34-BW0002D-045.5-20120626
R1204087-007	LC34-BW0002E-052.5-20120626
R1204087-008	LC34-BW0002F-059.5-20120626
R1204087-009	LC34-IW0076-075.0-20120626
R1204087-010	LC34-IW0002I-027.5-20120626
R1204087-011	LC34-IW0002D-037.5-20120626
R1204087-012	LC34-IW0002D1-052.5-20120626
R1204087-013	LC34-IW0067D-040.5-20120626
R1204087-014	LC34-IW0067D1-068.0-20120626
R1204087-015	LC34-RW0007-038.5-20120626
R1204087-016	LC34-RW0008-052.0-20120626
R1204087-017	LC34-BW0001A-024.5-20120626
R1204087-018	LC34-BW0001B-031.5-20120626
R1204087-019	LC34-BW0001C-038.5-20120626
R1204087-020	LC34-BW0001D-045.5-20120626
R1204087-021	LC34-BW0001E-052.5-20120626
R1204087-022	LC34-BW0001F-059.5-20120626
R1204087-023	LC34-BW0002A-024.5-20120626
R1204087-024	LC34-BW0002B-031.5-20120626

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
AZLA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0938
Date Received: 6/27/12
Date Analyzed: 6/29/12 17:12

Sample Name: LC34-IW0070D-040.5-20120626
Lab Code: R1204087-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0021.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0938
Date Received: 6/27/12
Date Analyzed: 6/29/12 17:12

Sample Name: LC34-IW0070D-040.5-20120626
Lab Code: R1204087-001

Units: µg/L
Basis: NA

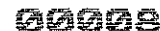
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0021.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	6/29/12 17:12	
Dibromofluoromethane	93	89-119	6/29/12 17:12	
Toluene-d8	94	87-121	6/29/12 17:12	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0908
Date Received: 6/27/12
Date Analyzed: 6/29/12 17:45

Sample Name: LC34-IW0070D1-070.0-20120626
Lab Code: R1204087-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0022.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0908
Date Received: 6/27/12
Date Analyzed: 6/29/12 17:45

Sample Name: LC34-IW0070D1-070.0-20120626
Lab Code: R1204087-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\062912\T0022.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	6/29/12 17:45	
Dibromofluoromethane	95	89-119	6/29/12 17:45	
Toluene-d8	96	87-121	6/29/12 17:45	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1016
Date Received: 6/27/12
Date Analyzed: 6/29/12 18:18

Sample Name: LC34-IW0071D-040.5-20120626
Lab Code: R1204087-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\062912\T0023.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1016
Date Received: 6/27/12
Date Analyzed: 6/29/12 18:18

Sample Name: LC34-IW0071D-040.5-20120626
Lab Code: R1204087-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\062912\T0023.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	6/29/12 18:18	
Dibromofluoromethane	94	89-119	6/29/12 18:18	
Toluene-d8	95	87-121	6/29/12 18:18	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1041
Date Received: 6/27/12
Date Analyzed: 6/29/12 18:51

Sample Name: LC34-IW0071D1-070.0-20120626
Lab Code: R1204087-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\062912\T0024.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1041
Date Received: 6/27/12
Date Analyzed: 6/29/12 18:51

Sample Name: LC34-IW0071D1-070.0-20120626
Lab Code: R1204087-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0024.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	85-122	6/29/12 18:51	
Dibromofluoromethane	89	89-119	6/29/12 18:51	
Toluene-d8	95	87-121	6/29/12 18:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120626
Lab Code: R1204087-005

Service Request: R1204087
Date Collected: 6/26/12 1123
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	49.1	mg/L	4.0	4	NA	7/3/12 19:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120626
Lab Code: R1204087-005

Service Request: R1204087
Date Collected: 6/26/12 1123
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.2	5	NA	6/29/12 19:57		298106	
1,1,2,2-Tetrachloroethane	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,1,2-Trichloroethane	25	U	25	1.2	5	NA	6/29/12 19:57		298106	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.7	I	25	1.6	5	NA	6/29/12 19:57		298106	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,1-Dichloroethene (1,1-DCE)	13	I	25	1.5	5	NA	6/29/12 19:57		298106	
1,2,4-Trichlorobenzene	25	U	25	1.3	5	NA	6/29/12 19:57		298106	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	5	NA	6/29/12 19:57		298106	
1,2-Dibromoethane	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,2-Dichlorobenzene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,2-Dichloroethane	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,2-Dichloropropane	25	U	25	1.5	5	NA	6/29/12 19:57		298106	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
n-Butanol	1300	U	1300	53	5	NA	6/29/12 19:57		298106	
2-Butanone (MEK)	50	U	50	2.6	5	NA	6/29/12 19:57		298106	
2-Hexanone	50	U	50	1.8	5	NA	6/29/12 19:57		298106	
4-Methyl-2-pentanone	50	U	50	1.4	5	NA	6/29/12 19:57		298106	
Acetone	50	U	50	4.9	5	NA	6/29/12 19:57		298106	
Benzene	25	U	25	1.1	5	NA	6/29/12 19:57		298106	
Bromodichloromethane	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Bromoform	25	U	25	1.4	5	NA	6/29/12 19:57		298106	
Bromomethane	25	U	25	1.6	5	NA	6/29/12 19:57		298106	
Carbon Disulfide	3.6	I	50	1.0	5	NA	6/29/12 19:57		298106	
Carbon Tetrachloride	25	U	25	1.4	5	NA	6/29/12 19:57		298106	
Chlorobenzene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Chloroethane	25	U	25	1.6	5	NA	6/29/12 19:57		298106	
Chloroform	25	U	25	1.1	5	NA	6/29/12 19:57		298106	
Chloromethane	25	U	25	1.2	5	NA	6/29/12 19:57		298106	
Cyclohexane	50	U	50	1.2	5	NA	6/29/12 19:57		298106	
Dibromochloromethane	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	5	NA	6/29/12 19:57		298106	
Dichloromethane	25	U	25	1.1	5	NA	6/29/12 19:57		298106	
Ethylbenzene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Methyl Acetate	50	U	50	1.2	5	NA	6/29/12 19:57		298106	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120626
Lab Code: R1204087-005

Service Request: R1204087
Date Collected: 6/26/12 1123
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Methylcyclohexane	50	U	50	1.3	5	NA	6/29/12 19:57		298106	
Styrene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Toluene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Trichloroethene (TCE)	5.7	I	25	1.2	5	NA	6/29/12 19:57		298106	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
Vinyl Chloride	13000		1000	46	200	NA	7/3/12 20:09		298776	
cis-1,2-Dichloroethene	30000		1000	40	200	NA	7/3/12 20:09		298776	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
m,p-Xylenes	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
n-Butyl Acetate	25	U	25	1.1	5	NA	6/29/12 19:57		298106	
o-Xylene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	
trans-1,2-Dichloroethene	250		25	1.0	5	NA	6/29/12 19:57		298106	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	6/29/12 19:57		298106	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	85-122	6/29/12 19:57	
Dibromofluoromethane	94	89-119	6/29/12 19:57	
Toluene-d8	95	87-121	6/29/12 19:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120626
Lab Code: R1204087-005

Service Request: R1204087
Date Collected: 6/26/12 1123
Date Received: 6/27/12

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	65		2.0	2	NA	6/29/12 10:28		298325	
Ethene	430		10	10	NA	6/29/12 10:40		298325	
Methane	690		20	10	NA	6/29/12 10:40		298325	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20120626
Lab Code: R1204087-006

Service Request: R1204087
Date Collected: 6/26/12 1044
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	104		mg/L	10	10	NA	6/29/12 21:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1044
Date Received: 6/27/12
Date Analyzed: 6/29/12 20:30

Sample Name: LC34-BW0002D-045.5-20120626
Lab Code: R1204087-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0027.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 100

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500 U	500	23	
79-34-5	1,1,2,2-Tetrachloroethane	500 U	500	20	
79-00-5	1,1,2-Trichloroethane	500 U	500	23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	37 I	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500 U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500 U	500	29	
120-82-1	1,2,4-Trichlorobenzene	500 U	500	26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500 U	500	38	
106-93-4	1,2-Dibromoethane	500 U	500	20	
95-50-1	1,2-Dichlorobenzene	500 U	500	20	
107-06-2	1,2-Dichloroethane	500 U	500	20	
78-87-5	1,2-Dichloropropane	500 U	500	29	
541-73-1	1,3-Dichlorobenzene	500 U	500	20	
106-46-7	1,4-Dichlorobenzene	500 U	500	20	
71-36-3	n-Butanol	25000 U	25000	1100	
78-93-3	2-Butanone (MEK)	1000 U	1000	51	
591-78-6	2-Hexanone	1000 U	1000	35	
108-10-1	4-Methyl-2-pentanone	1000 U	1000	27	
67-64-1	Acetone	1000 U	1000	98	
71-43-2	Benzene	500 U	500	21	
75-27-4	Bromodichloromethane	500 U	500	20	
75-25-2	Bromoform	500 U	500	27	
74-83-9	Bromomethane	500 U	500	31	
75-15-0	Carbon Disulfide	42 I	1000	20	
56-23-5	Carbon Tetrachloride	500 U	500	27	
108-90-7	Chlorobenzene	500 U	500	20	
75-00-3	Chloroethane	500 U	500	31	
67-66-3	Chloroform	500 U	500	22	
74-87-3	Chloromethane	500 U	500	24	
110-82-7	Cyclohexane	1000 U	1000	24	
124-48-1	Dibromochloromethane	500 U	500	20	
75-71-8	Dichlorodifluoromethane (CFC 12)	500 U	500	57	
75-09-2	Dichloromethane	500 U	500	22	
100-41-4	Ethylbenzene	500 U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1044
Date Received: 6/27/12
Date Analyzed: 6/29/12 20:30

Sample Name: LC34-BW0002D-045.5-20120626
Lab Code: R1204087-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0027.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	23	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	20	
108-87-2	Methylcyclohexane	1000	U	1000	25	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	20	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	500	U	500	23	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	12000		500	23	
156-59-2	cis-1,2-Dichloroethene	5100		500	20	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	20	
179601-23-1	m,p-Xylenes	500	U	500	20	
123-86-4	n-Butyl Acetate	500	U	500	21	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	110	I	500	20	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/29/12 20:30	
Dibromofluoromethane	93	89-119	6/29/12 20:30	
Toluene-d8	94	87-121	6/29/12 20:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20120626
Lab Code: R1204087-006

Service Request: R1204087
Date Collected: 6/26/12 1044
Date Received: 6/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	42		2.0	2	NA	6/29/12 10:50		298325	
Ethene	560		20	20	NA	6/29/12 13:02		298325	
Methane	1400		40	20	NA	6/29/12 13:02		298325	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20120626
Lab Code: R1204087-007

Service Request: R1204087
Date Collected: 6/26/12 1000
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	5.3		mg/L	1.0	1	NA	6/29/12 22:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1000
Date Received: 6/27/12
Date Analyzed: 6/29/12 19:24

Sample Name: LC34-BW0002E-052.5-20120626
Lab Code: R1204087-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0025.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.49 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1000
Date Received: 6/27/12
Date Analyzed: 6/29/12 19:24

Sample Name: LC34-BW0002E-052.5-20120626
Lab Code: R1204087-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0025.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	15		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	0.71	I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	0.75	I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/29/12 19:24	
Dibromofluoromethane	93	89-119	6/29/12 19:24	
Toluene-d8	94	87-121	6/29/12 19:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20120626
Lab Code: R1204087-007

Service Request: R1204087
Date Collected: 6/26/12 1000
Date Received: 6/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	3.3		1.0	1	NA	6/29/12 11:14		298325	
Ethene	160		2.0	2	NA	6/29/12 11:24		298325	
Methane	78		2.0	1	NA	6/29/12 11:14		298325	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120626
Lab Code: R1204087-008

Service Request: R1204087
Date Collected: 6/26/12 0917
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	3.4		mg/L	1.0	1	NA	6/29/12 23:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120626
Lab Code: R1204087-008

Service Request: R1204087
Date Collected: 6/26/12 0917
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/30/12 02:34		298544	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/30/12 02:34		298544	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	6/30/12 02:34		298544	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	6/30/12 02:34		298544	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	6/30/12 02:34		298544	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/30/12 02:34		298544	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/30/12 02:34		298544	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
n-Butanol	250	U	250	11	1	NA	6/30/12 02:34		298544	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/30/12 02:34		298544	
2-Hexanone	10	U	10	0.35	1	NA	6/30/12 02:34		298544	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/30/12 02:34		298544	
Acetone	10	U	10	0.98	1	NA	6/30/12 02:34		298544	
Benzene	5.0	U	5.0	0.21	1	NA	6/30/12 02:34		298544	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Bromoform	5.0	U	5.0	0.27	1	NA	6/30/12 02:34		298544	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/30/12 02:34		298544	
Carbon Disulfide	1.2	I	10	0.20	1	NA	6/30/12 02:34		298544	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/30/12 02:34		298544	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/30/12 02:34		298544	
Chloroform	5.0	U	5.0	0.22	1	NA	6/30/12 02:34		298544	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/30/12 02:34		298544	
Cyclohexane	10	U	10	0.24	1	NA	6/30/12 02:34		298544	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/30/12 02:34		298544	
Dichloromethane	5.0	U	5.0	0.22	1	NA	6/30/12 02:34		298544	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Methyl Acetate	10	U	10	0.23	1	NA	6/30/12 02:34		298544	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120626
Lab Code: R1204087-008

Service Request: R1204087
Date Collected: 6/26/12 0917
Date Received: 6/27/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Methylcyclohexane	10	U	10	0.25	1	NA	6/30/12 02:34		298544	
Styrene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Toluene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	6/30/12 02:34		298544	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
Vinyl Chloride	160		10	0.46	2	NA	7/2/12 22:03		298588	
cis-1,2-Dichloroethene	1.6	I	5.0	0.20	1	NA	6/30/12 02:34		298544	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/30/12 02:34		298544	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	
trans-1,2-Dichloroethene	4.6	I	5.0	0.20	1	NA	6/30/12 02:34		298544	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/30/12 02:34		298544	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 02:34	
Dibromofluoromethane	93	89-119	6/30/12 02:34	
Toluene-d8	94	87-121	6/30/12 02:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0917
Date Received: 6/27/12
Date Analyzed: 6/29/12 11:34

Sample Name: LC34-BW0002F-059.5-20120626
Lab Code: R1204087-008

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star284.run

Analysis Lot: 298325
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.2		1.0	
74-85-1	Ethene	65		1.0	
74-82-8	Methane	19		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120626
Lab Code: R1204087-009

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.3		mg/L	1.0	1	NA	6/30/12 02:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120626
Lab Code: R1204087-009

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	6/30/12 03:07		298544	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	6/30/12 03:07		298544	
1,1,2-Trichloro-1,2,2-trifluoroethane	660		130	7.8	25	NA	7/3/12 00:48		298588	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,1-Dichloroethene (1,1-DCE)	4.3	I	5.0	0.29	1	NA	6/30/12 03:07		298544	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	6/30/12 03:07		298544	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	6/30/12 03:07		298544	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	6/30/12 03:07		298544	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
n-Butanol	960		250	11	1	NA	6/30/12 03:07		298544	
2-Butanone (MEK)	10	U	10	0.51	1	NA	6/30/12 03:07		298544	
2-Hexanone	10	U	10	0.35	1	NA	6/30/12 03:07		298544	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	6/30/12 03:07		298544	
Acetone	10	U	10	0.98	1	NA	6/30/12 03:07		298544	
Benzene	5.0	U	5.0	0.21	1	NA	6/30/12 03:07		298544	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Bromoform	5.0	U	5.0	0.27	1	NA	6/30/12 03:07		298544	
Bromomethane	5.0	U	5.0	0.31	1	NA	6/30/12 03:07		298544	
Carbon Disulfide	3.8	I	10	0.20	1	NA	6/30/12 03:07		298544	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	6/30/12 03:07		298544	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Chloroethane	5.0	U	5.0	0.31	1	NA	6/30/12 03:07		298544	
Chloroform	1.4	I	5.0	0.22	1	NA	6/30/12 03:07		298544	
Chloromethane	5.0	U	5.0	0.24	1	NA	6/30/12 03:07		298544	
Cyclohexane	10	U	10	0.24	1	NA	6/30/12 03:07		298544	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	6/30/12 03:07		298544	
Dichloromethane	0.49	I	5.0	0.22	1	NA	6/30/12 03:07		298544	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Methyl Acetate	10	U	10	0.23	1	NA	6/30/12 03:07		298544	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120626
Lab Code: R1204087-009

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Methylcyclohexane	10	U	10	0.25	1	NA	6/30/12 03:07		298544	
Styrene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Toluene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Trichloroethene (TCE)	2.7	I	5.0	0.23	1	NA	6/30/12 03:07		298544	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
Vinyl Chloride	170		5.0	0.23	1	NA	6/30/12 03:07		298544	
cis-1,2-Dichloroethene	5000		130	5.0	25	NA	7/3/12 00:48		298588	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	6/30/12 03:07		298544	
o-Xylene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	
trans-1,2-Dichloroethene	81		5.0	0.20	1	NA	6/30/12 03:07		298544	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	6/30/12 03:07		298544	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 03:07	
Dibromofluoromethane	94	89-119	6/30/12 03:07	
Toluene-d8	95	87-121	6/30/12 03:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Date Analyzed: 6/29/12 12:52

Sample Name: LC34-IW0076-075.0-20120626
Lab Code: R1204087-009

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star286.run

Analysis Lot: 298325
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	10 U	10	
74-85-1	Ethene	10 U	10	
74-82-8	Methane	980	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120626
Lab Code: R1204087-010

Service Request: R1204087
Date Collected: 6/26/12 1414
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	3.0		mg/L	1.0	1	NA	6/30/12 02:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1414
Date Received: 6/27/12
Date Analyzed: 6/30/12 04:46

Sample Name: LC34-IW0002I-027.5-20120626
Lab Code: R1204087-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0042.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	1000	U	1000	46	
79-34-5	1,1,2,2-Tetrachloroethane	1000	U	1000	40	
79-00-5	1,1,2-Trichloroethane	1000	U	1000	46	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	19000		1000	62	
75-34-3	1,1-Dichloroethane (1,1-DCA)	1000	U	1000	40	
75-35-4	1,1-Dichloroethene (1,1-DCE)	1000	U	1000	58	
120-82-1	1,2,4-Trichlorobenzene	1000	U	1000	52	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	1000	U	1000	76	
106-93-4	1,2-Dibromoethane	1000	U	1000	40	
95-50-1	1,2-Dichlorobenzene	1000	U	1000	40	
107-06-2	1,2-Dichloroethane	1000	U	1000	40	
78-87-5	1,2-Dichloropropane	1000	U	1000	57	
541-73-1	1,3-Dichlorobenzene	1000	U	1000	40	
106-46-7	1,4-Dichlorobenzene	1000	U	1000	40	
71-36-3	n-Butanol	50000	U	50000	2100	
78-93-3	2-Butanone (MEK)	2000	U	2000	110	
591-78-6	2-Hexanone	2000	U	2000	70	
108-10-1	4-Methyl-2-pentanone	2000	U	2000	54	
67-64-1	Acetone	410	I	2000	200	
71-43-2	Benzene	1000	U	1000	42	
75-27-4	Bromodichloromethane	1000	U	1000	40	
75-25-2	Bromoform	1000	U	1000	54	
74-83-9	Bromomethane	1000	U	1000	62	
75-15-0	Carbon Disulfide	86	I	2000	40	
56-23-5	Carbon Tetrachloride	1000	U	1000	54	
108-90-7	Chlorobenzene	1000	U	1000	40	
75-00-3	Chloroethane	1000	U	1000	62	
67-66-3	Chloroform	1000	U	1000	44	
74-87-3	Chloromethane	1000	U	1000	48	
110-82-7	Cyclohexane	2000	U	2000	48	
124-48-1	Dibromochloromethane	1000	U	1000	40	
75-71-8	Dichlorodifluoromethane (CFC 12)	1000	U	1000	120	
75-09-2	Dichloromethane	1000	U	1000	44	
100-41-4	Ethylbenzene	1000	U	1000	40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1414
Date Received: 6/27/12
Date Analyzed: 6/30/12 04:46

Sample Name: LC34-IW0002I-027.5-20120626
Lab Code: R1204087-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0042.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 200

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	1000	U	1000	40	
79-20-9	Methyl Acetate	2000	U	2000	46	
1634-04-4	Methyl tert-Butyl Ether	1000	U	1000	40	
108-87-2	Methylcyclohexane	2000	U	2000	50	
100-42-5	Styrene	1000	U	1000	40	
127-18-4	Tetrachloroethene (PCE)	1000	U	1000	40	
108-88-3	Toluene	1000	U	1000	40	
79-01-6	Trichloroethene (TCE)	1000	U	1000	46	
75-69-4	Trichlorofluoromethane (CFC 11)	1000	U	1000	40	
75-01-4	Vinyl Chloride	110	I	1000	46	
156-59-2	cis-1,2-Dichloroethene	970	I	1000	40	
10061-01-5	cis-1,3-Dichloropropene	1000	U	1000	40	
179601-23-1	m,p-Xylenes	1000	U	1000	40	
123-86-4	n-Butyl Acetate	1000	U	1000	42	
95-47-6	o-Xylene	1000	U	1000	40	
156-60-5	trans-1,2-Dichloroethene	40	I	1000	40	
10061-02-6	trans-1,3-Dichloropropene	1000	U	1000	40	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 04:46	
Dibromofluoromethane	92	89-119	6/30/12 04:46	
Toluene-d8	94	87-121	6/30/12 04:46	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1414
Date Received: 6/27/12
Date Analyzed: 6/29/12 13:13

Sample Name: LC34-IW0002I-027.5-20120626
Lab Code: R1204087-010

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star288.run

Analysis Lot: 298325
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.6		1.0	
74-85-1	Ethene	5.5		1.0	
74-82-8	Methane	35		2.0	



COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120626
Lab Code: R1204087-011

Service Request: R1204087
Date Collected: 6/26/12 1419
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	22.9		mg/L	1.0	1	NA	7/3/12 20:10	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1419
Date Received: 6/27/12
Date Analyzed: 7/3/12 01:21

Sample Name: LC34-IW0002D-037.5-20120626
Lab Code: R1204087-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0080.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	5.8	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	5.0	
79-00-5	1,1,2-Trichloroethane	130	U	130	5.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	120	I	130	7.8	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	6.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	
106-93-4	1,2-Dibromoethane	130	U	130	5.0	
95-50-1	1,2-Dichlorobenzene	130	U	130	5.0	
107-06-2	1,2-Dichloroethane	130	U	130	5.0	
78-87-5	1,2-Dichloropropane	130	U	130	7.1	
541-73-1	1,3-Dichlorobenzene	130	U	130	5.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	5.0	
71-36-3	n-Butanol	6300	U	6300	270	
78-93-3	2-Butanone (MEK)	250	U	250	13	
591-78-6	2-Hexanone	250	U	250	8.8	
108-10-1	4-Methyl-2-pentanone	250	U	250	6.8	
67-64-1	Acetone	250	U	250	25	
71-43-2	Benzene	130	U	130	5.3	
75-27-4	Bromodichloromethane	130	U	130	5.0	
75-25-2	Bromoform	130	U	130	6.8	
74-83-9	Bromomethane	130	U	130	7.8	
75-15-0	Carbon Disulfide	33	I	250	5.0	
56-23-5	Carbon Tetrachloride	130	U	130	6.8	
108-90-7	Chlorobenzene	130	U	130	5.0	
75-00-3	Chloroethane	130	U	130	7.8	
67-66-3	Chloroform	130	U	130	5.5	
74-87-3	Chloromethane	130	U	130	6.0	
110-82-7	Cyclohexane	250	U	250	6.0	
124-48-1	Dibromochloromethane	130	U	130	5.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	15	
75-09-2	Dichloromethane	130	U	130	5.5	
100-41-4	Ethylbenzene	130	U	130	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1419
Date Received: 6/27/12
Date Analyzed: 7/3/12 01:21

Sample Name: LC34-IW0002D-037.5-20120626
Lab Code: R1204087-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0080.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	130	U	130	5.0	
79-20-9	Methyl Acetate	250	U	250	5.8	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	5.0	
108-87-2	Methylcyclohexane	250	U	250	6.3	
100-42-5	Styrene	130	U	130	5.0	
127-18-4	Tetrachloroethene (PCE)	130	U	130	5.0	
108-88-3	Toluene	130	U	130	5.0	
79-01-6	Trichloroethene (TCE)	12	I	130	5.8	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	5.0	
75-01-4	Vinyl Chloride	3800		130	5.8	
156-59-2	cis-1,2-Dichloroethene	3400		130	5.0	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	5.0	
179601-23-1	m,p-Xylenes	130	U	130	5.0	
123-86-4	n-Butyl Acetate	130	U	130	5.3	
95-47-6	o-Xylene	130	U	130	5.0	
156-60-5	trans-1,2-Dichloroethene	190		130	5.0	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	7/3/12 01:21	
Dibromofluoromethane	92	89-119	7/3/12 01:21	
Toluene-d8	95	87-121	7/3/12 01:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120626
Lab Code: R1204087-011

Service Request: R1204087
Date Collected: 6/26/12 1419
Date Received: 6/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	40		10	10	NA	6/29/12 13:23		298325	
Ethene	920		20	20	NA	6/29/12 13:53		298325	
Methane	970		20	10	NA	6/29/12 13:23		298325	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120626
Lab Code: R1204087-012

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	48.9		mg/L	4.0	4	NA	6/30/12 04:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Date Analyzed: 6/30/12 05:52

Sample Name: LC34-IW0002D1-052.5-20120626
Lab Code: R1204087-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\062912\T0044.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 20

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100 U	100	4.7	
79-34-5	1,1,2,2-Tetrachloroethane	100 U	100	4.0	
79-00-5	1,1,2-Trichloroethane	100 U	100	4.7	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.0 I	100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100 U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100 U	100	5.8	
120-82-1	1,2,4-Trichlorobenzene	100 U	100	5.2	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100 U	100	7.6	
106-93-4	1,2-Dibromoethane	100 U	100	4.0	
95-50-1	1,2-Dichlorobenzene	100 U	100	4.0	
107-06-2	1,2-Dichloroethane	100 U	100	4.0	
78-87-5	1,2-Dichloropropane	100 U	100	5.7	
541-73-1	1,3-Dichlorobenzene	100 U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100 U	100	4.0	
71-36-3	n-Butanol	5000 U	5000	210	
78-93-3	2-Butanone (MEK)	200 U	200	11	
591-78-6	2-Hexanone	200 U	200	7.0	
108-10-1	4-Methyl-2-pentanone	200 U	200	5.4	
67-64-1	Acetone	200 U	200	20	
71-43-2	Benzene	100 U	100	4.2	
75-27-4	Bromodichloromethane	100 U	100	4.0	
75-25-2	Bromoform	100 U	100	5.4	
74-83-9	Bromomethane	100 U	100	6.2	
75-15-0	Carbon Disulfide	6.6 I	200	4.0	
56-23-5	Carbon Tetrachloride	100 U	100	5.4	
108-90-7	Chlorobenzene	100 U	100	4.0	
75-00-3	Chloroethane	100 U	100	6.2	
67-66-3	Chloroform	100 U	100	4.4	
74-87-3	Chloromethane	100 U	100	4.8	
110-82-7	Cyclohexane	200 U	200	4.8	
124-48-1	Dibromochloromethane	100 U	100	4.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	100 U	100	12	
75-09-2	Dichloromethane	100 U	100	4.4	
100-41-4	Ethylbenzene	100 U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Date Analyzed: 6/30/12 05:52

Sample Name: LC34-IW0002D1-052.5-20120626
Lab Code: R1204087-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0044.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	4.7	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	4.0	
108-87-2	Methylcyclohexane	200	U	200	5.0	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	4.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	100	U	100	4.7	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	2000		100	4.7	
156-59-2	cis-1,2-Dichloroethene	9.8	I	100	4.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.0	
179601-23-1	m,p-Xylenes	100	U	100	4.0	
123-86-4	n-Butyl Acetate	100	U	100	4.2	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	58	I	100	4.0	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	6/30/12 05:52	
Dibromofluoromethane	93	89-119	6/30/12 05:52	
Toluene-d8	94	87-121	6/30/12 05:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-IW0002D1-052.5-20120626
Lab Code: R1204087-012

Service Request: R1204087
Date Collected: 6/26/12 1333
Date Received: 6/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution	Date	Date	Extraction Analysis		Note
				Factor	Extracted	Analyzed	Lot	Lot	
Ethane	32		5.0	5	NA	6/29/12 13:34		298325	
Ethene	1400		25	25	NA	6/29/12 14:09		298325	
Methane	1300		50	25	NA	6/29/12 14:09		298325	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1210
Date Received: 6/27/12
Date Analyzed: 7/2/12 19:51

Sample Name: LC34-IW0067D-040.5-20120626
Lab Code: R1204087-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0070.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.63 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1210
Date Received: 6/27/12
Date Analyzed: 7/2/12 19:51

Sample Name: LC34-IW0067D-040.5-20120626
Lab Code: R1204087-013

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0070.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	0.32 I	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	18	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	1.2 I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	7/2/12 19:51	
Dibromofluoromethane	95	89-119	7/2/12 19:51	
Toluene-d8	95	87-121	7/2/12 19:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1139
Date Received: 6/27/12
Date Analyzed: 7/2/12 20:24

Sample Name: LC34-IW0067D1-068.0-20120626
Lab Code: R1204087-014

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0071.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	0.27 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1139
Date Received: 6/27/12
Date Analyzed: 7/2/12 20:24

Sample Name: LC34-IW0067D1-068.0-20120626
Lab Code: R1204087-014

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0071.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	7/2/12 20:24	
Dibromofluoromethane	95	89-119	7/2/12 20:24	
Toluene-d8	95	87-121	7/2/12 20:24	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120626
Lab Code: R1204087-015

Service Request: R1204087
Date Collected: 6/26/12 1326
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	63		mg/L	10	10	NA	6/30/12 04:52	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1326
Date Received: 6/27/12
Date Analyzed: 6/30/12 06:25

Sample Name: LC34-RW0007-038.5-20120626
Lab Code: R1204087-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0045.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250 U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250 U	250	10	
79-00-5	1,1,2-Trichloroethane	250 U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	9500	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250 U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250 U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250 U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250 U	250	19	
106-93-4	1,2-Dibromoethane	250 U	250	10	
95-50-1	1,2-Dichlorobenzene	250 U	250	10	
107-06-2	1,2-Dichloroethane	250 U	250	10	
78-87-5	1,2-Dichloropropane	250 U	250	15	
541-73-1	1,3-Dichlorobenzene	250 U	250	10	
106-46-7	1,4-Dichlorobenzene	250 U	250	10	
71-36-3	n-Butanol	13000 U	13000	530	
78-93-3	2-Butanone (MEK)	500 U	500	26	
591-78-6	2-Hexanone	500 U	500	18	
108-10-1	4-Methyl-2-pentanone	500 U	500	14	
67-64-1	Acetone	500 U	500	49	
71-43-2	Benzene	250 U	250	11	
75-27-4	Bromodichloromethane	250 U	250	10	
75-25-2	Bromoform	250 U	250	14	
74-83-9	Bromomethane	250 U	250	16	
75-15-0	Carbon Disulfide	27 I	500	10	
56-23-5	Carbon Tetrachloride	250 U	250	14	
108-90-7	Chlorobenzene	250 U	250	10	
75-00-3	Chloroethane	250 U	250	16	
67-66-3	Chloroform	250 U	250	11	
74-87-3	Chloromethane	250 U	250	12	
110-82-7	Cyclohexane	500 U	500	12	
124-48-1	Dibromochloromethane	250 U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250 U	250	29	
75-09-2	Dichloromethane	250 U	250	11	
100-41-4	Ethylbenzene	250 U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1326
Date Received: 6/27/12
Date Analyzed: 6/30/12 06:25

Sample Name: LC34-RW0007-038.5-20120626
Lab Code: R1204087-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0045.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	820		250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	8100		250	12	
156-59-2	cis-1,2-Dichloroethene	5500		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	250	U	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	250		250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	6/30/12 06:25	
Dibromofluoromethane	94	89-119	6/30/12 06:25	
Toluene-d8	91	87-121	6/30/12 06:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1326
Date Received: 6/27/12
Date Analyzed: 7/2/12 10:33

Sample Name: LC34-RW0007-038.5-20120626
Lab Code: R1204087-015

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star298.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	41		20	
74-85-1	Ethene	1200		20	
74-82-8	Methane	1700		40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120626
Lab Code: R1204087-016

Service Request: R1204087
Date Collected: 6/26/12 1416
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	37.1		mg/L	4.0	4	NA	6/30/12 05:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120626
Lab Code: R1204087-016

Service Request: R1204087
Date Collected: 6/26/12 1416
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.2	5	NA	7/2/12 23:09		298588	
1,1,2,2-Tetrachloroethane	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,1,2-Trichloroethane	25	U	25	1.2	5	NA	7/2/12 23:09		298588	
1,1,2-Trichloro-1,2,2-trifluoroethane	900		50	3.1	10	NA	6/30/12 06:58		298544	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,1-Dichloroethene (1,1-DCE)	25	U	25	1.5	5	NA	7/2/12 23:09		298588	
1,2,4-Trichlorobenzene	25	U	25	1.3	5	NA	7/2/12 23:09		298588	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	5	NA	7/2/12 23:09		298588	
1,2-Dibromoethane	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,2-Dichlorobenzene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,2-Dichloroethane	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,2-Dichloropropane	25	U	25	1.5	5	NA	7/2/12 23:09		298588	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
n-Butanol	1300	U	1300	53	5	NA	7/2/12 23:09		298588	
2-Butanone (MEK)	50	U	50	2.6	5	NA	7/2/12 23:09		298588	
2-Hexanone	50	U	50	1.8	5	NA	7/2/12 23:09		298588	
4-Methyl-2-pentanone	50	U	50	1.4	5	NA	7/2/12 23:09		298588	
Acetone	50	U	50	4.9	5	NA	7/2/12 23:09		298588	
Benzene	25	U	25	1.1	5	NA	7/2/12 23:09		298588	
Bromodichloromethane	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Bromoform	25	U	25	1.4	5	NA	7/2/12 23:09		298588	
Bromomethane	25	U	25	1.6	5	NA	7/2/12 23:09		298588	
Carbon Disulfide	8.7	I	50	1.0	5	NA	7/2/12 23:09		298588	
Carbon Tetrachloride	25	U	25	1.4	5	NA	7/2/12 23:09		298588	
Chlorobenzene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Chloroethane	25	U	25	1.6	5	NA	7/2/12 23:09		298588	
Chloroform	25	U	25	1.1	5	NA	7/2/12 23:09		298588	
Chloromethane	25	U	25	1.2	5	NA	7/2/12 23:09		298588	
Cyclohexane	50	U	50	1.2	5	NA	7/2/12 23:09		298588	
Dibromochloromethane	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	5	NA	7/2/12 23:09		298588	
Dichloromethane	25	U	25	1.1	5	NA	7/2/12 23:09		298588	
Ethylbenzene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Methyl Acetate	50	U	50	1.2	5	NA	7/2/12 23:09		298588	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120626
Lab Code: R1204087-016

Service Request: R1204087
Date Collected: 6/26/12 1416
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Methylcyclohexane	50	U	50	1.3	5	NA	7/2/12 23:09		298588	
Styrene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Toluene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Trichloroethene (TCE)	620		25	1.2	5	NA	7/2/12 23:09		298588	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
Vinyl Chloride	990		25	1.2	5	NA	7/2/12 23:09		298588	
cis-1,2-Dichloroethene	970		25	1.0	5	NA	7/2/12 23:09		298588	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
m,p-Xylenes	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
n-Butyl Acetate	25	U	25	1.1	5	NA	7/2/12 23:09		298588	
o-Xylene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	
trans-1,2-Dichloroethene	21	I	25	1.0	5	NA	7/2/12 23:09		298588	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	7/2/12 23:09		298588	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	7/2/12 23:09	
Dibromofluoromethane	95	89-119	7/2/12 23:09	
Toluene-d8	95	87-121	7/2/12 23:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1416
Date Received: 6/27/12
Date Analyzed: 7/2/12 10:43

Sample Name: LC34-RW0008-052.0-20120626
Lab Code: R1204087-016

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star299.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	23		10	
74-85-1	Ethene	910		10	
74-82-8	Methane	620		20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120626
Lab Code: R1204087-017

Service Request: R1204087
Date Collected: 6/26/12 0906
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.6	mg/L	1.0	1	NA	6/30/12 06:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0906
Date Received: 6/27/12
Date Analyzed: 6/30/12 07:31

Sample Name: LC34-BW0001A-024.5-20120626
Lab Code: R1204087-017

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0047.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	120	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	100	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	120	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	50000		2500	160	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	150	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	130	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	190	
106-93-4	1,2-Dibromoethane	2500	U	2500	100	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	100	
107-06-2	1,2-Dichloroethane	2500	U	2500	100	
78-87-5	1,2-Dichloropropane	2500	U	2500	140	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	100	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	100	
71-36-3	n-Butanol	130000	U	130000	5300	
78-93-3	2-Butanone (MEK)	5000	U	5000	260	
591-78-6	2-Hexanone	5000	U	5000	180	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	140	
67-64-1	Acetone	5000	U	5000	490	
71-43-2	Benzene	2500	U	2500	110	
75-27-4	Bromodichloromethane	2500	U	2500	100	
75-25-2	Bromoform	2500	U	2500	140	
74-83-9	Bromomethane	2500	U	2500	160	
75-15-0	Carbon Disulfide	110	I	5000	100	
56-23-5	Carbon Tetrachloride	2500	U	2500	140	
108-90-7	Chlorobenzene	2500	U	2500	100	
75-00-3	Chloroethane	2500	U	2500	160	
67-66-3	Chloroform	2500	U	2500	110	
74-87-3	Chloromethane	2500	U	2500	120	
110-82-7	Cyclohexane	5000	U	5000	120	
124-48-1	Dibromochloromethane	2500	U	2500	100	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	280	
75-09-2	Dichloromethane	2500	U	2500	110	
100-41-4	Ethylbenzene	2500	U	2500	100	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0906
Date Received: 6/27/12
Date Analyzed: 6/30/12 07:31

Sample Name: LC34-BW0001A-024.5-20120626
Lab Code: R1204087-017

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0047.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500	U	2500	100	
79-20-9	Methyl Acetate	5000	U	5000	120	
1634-04-4	Methyl tert-Butyl Ether	2500	U	2500	100	
108-87-2	Methylcyclohexane	5000	U	5000	130	
100-42-5	Styrene	2500	U	2500	100	
127-18-4	Tetrachloroethene (PCE)	2500	U	2500	100	
108-88-3	Toluene	2500	U	2500	100	
79-01-6	Trichloroethene (TCE)	2500	U	2500	120	
75-69-4	Trichlorofluoromethane (CFC 11)	2500	U	2500	100	
75-01-4	Vinyl Chloride	770	I	2500	120	
156-59-2	cis-1,2-Dichloroethene	6200		2500	100	
10061-01-5	cis-1,3-Dichloropropene	2500	U	2500	100	
179601-23-1	m,p-Xylenes	2500	U	2500	100	
123-86-4	n-Butyl Acetate	2500	U	2500	110	
95-47-6	o-Xylene	2500	U	2500	100	
156-60-5	trans-1,2-Dichloroethene	220	I	2500	100	
10061-02-6	trans-1,3-Dichloropropene	2500	U	2500	100	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 07:31	
Dibromofluoromethane	94	89-119	6/30/12 07:31	
Toluene-d8	95	87-121	6/30/12 07:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0906
Date Received: 6/27/12
Date Analyzed: 7/2/12 10:54

Sample Name: LC34-BW0001A-024.5-20120626
Lab Code: R1204087-017

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star300.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	3.2		1.0	
74-85-1	Ethene	25		1.0	
74-82-8	Methane	89		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20120626
Lab Code: R1204087-018

Service Request: R1204087
Date Collected: 6/26/12 0945
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	4.9		mg/L	1.0	1	NA	7/3/12 20:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0945
Date Received: 6/27/12
Date Analyzed: 6/30/12 08:04

Sample Name: LC34-BW0001B-031.5-20120626
Lab Code: R1204087-018

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0048.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	160000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	360	I	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	250000	U	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	10000	U	10000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	10000	U	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0945
Date Received: 6/27/12
Date Analyzed: 6/30/12 08:04

Sample Name: LC34-BW0001B-031.5-20120626
Lab Code: R1204087-018

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\062912\T0048.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	720	I	5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	1500	I	5000	230	
156-59-2	cis-1,2-Dichloroethene	28000		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	5000	U	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	750	I	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 08:04	
Dibromofluoromethane	93	89-119	6/30/12 08:04	
Toluene-d8	94	87-121	6/30/12 08:04	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 0945
Date Received: 6/27/12
Date Analyzed: 7/2/12 11:04

Sample Name: LC34-BW0001B-031.5-20120626
Lab Code: R1204087-018

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star301.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	7.3		1.0	
74-85-1	Ethene	30		1.0	
74-82-8	Methane	70		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120626
Lab Code: R1204087-019

Service Request: R1204087
Date Collected: 6/26/12 1035
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	120		mg/L	10	10	NA	7/3/12 21:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120626
Lab Code: R1204087-019

Service Request: R1204087
Date Collected: 6/26/12 1035
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	58	250	NA	6/30/12 08:37		298544	
1,1,2,2-Tetrachloroethane	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,1,2-Trichloroethane	1300	U	1300	58	250	NA	6/30/12 08:37		298544	
1,1,2-Trichloro-1,2,2-trifluoroethane	67000		2500	160	500	NA	7/3/12 02:27		298588	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	73	250	NA	6/30/12 08:37		298544	
1,2,4-Trichlorobenzene	1300	U	1300	65	250	NA	6/30/12 08:37		298544	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	95	250	NA	6/30/12 08:37		298544	
1,2-Dibromoethane	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,2-Dichlorobenzene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,2-Dichloroethane	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,2-Dichloropropane	1300	U	1300	70	250	NA	6/30/12 08:37		298544	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
n-Butanol	63000	U	63000	2700	250	NA	6/30/12 08:37		298544	
2-Butanone (MEK)	2500	U	2500	130	250	NA	6/30/12 08:37		298544	
2-Hexanone	2500	U	2500	88	250	NA	6/30/12 08:37		298544	
4-Methyl-2-pentanone	2500	U	2500	68	250	NA	6/30/12 08:37		298544	
Acetone	2500	U	2500	250	250	NA	6/30/12 08:37		298544	
Benzene	1300	U	1300	53	250	NA	6/30/12 08:37		298544	
Bromodichloromethane	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Bromoform	1300	U	1300	68	250	NA	6/30/12 08:37		298544	
Bromomethane	1300	U	1300	78	250	NA	6/30/12 08:37		298544	
Carbon Disulfide	78	I	2500	50	250	NA	6/30/12 08:37		298544	
Carbon Tetrachloride	1300	U	1300	68	250	NA	6/30/12 08:37		298544	
Chlorobenzene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Chloroethane	1300	U	1300	78	250	NA	6/30/12 08:37		298544	
Chloroform	1300	U	1300	55	250	NA	6/30/12 08:37		298544	
Chloromethane	1300	U	1300	60	250	NA	6/30/12 08:37		298544	
Cyclohexane	2500	U	2500	60	250	NA	6/30/12 08:37		298544	
Dibromochloromethane	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	140	250	NA	6/30/12 08:37		298544	
Dichloromethane	1300	U	1300	55	250	NA	6/30/12 08:37		298544	
Ethylbenzene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Methyl Acetate	2500	U	2500	58	250	NA	6/30/12 08:37		298544	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120626
Lab Code: R1204087-019

Service Request: R1204087
Date Collected: 6/26/12 1035
Date Received: 6/27/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Methylcyclohexane	2500	U	2500	63	250	NA	6/30/12 08:37		298544	
Styrene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Tetrachloroethene (PCE)	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Toluene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Trichloroethene (TCE)	370	I	1300	58	250	NA	6/30/12 08:37		298544	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
Vinyl Chloride	3800		1300	58	250	NA	6/30/12 08:37		298544	
cis-1,2-Dichloroethene	22000		1300	50	250	NA	6/30/12 08:37		298544	
cis-1,3-Dichloropropene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
m,p-Xylenes	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
n-Butyl Acetate	1300	U	1300	53	250	NA	6/30/12 08:37		298544	
o-Xylene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	
trans-1,2-Dichloroethene	460	I	1300	50	250	NA	6/30/12 08:37		298544	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	6/30/12 08:37		298544	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 08:37	
Dibromofluoromethane	95	89-119	6/30/12 08:37	
Toluene-d8	95	87-121	6/30/12 08:37	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120626
Lab Code: R1204087-019

Service Request: R1204087
Date Collected: 6/26/12 1035
Date Received: 6/27/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	50		10	10	NA	7/2/12 11:33		298512	
Ethene	660		10	10	NA	7/2/12 11:33		298512	
Methane	1600		40	20	NA	7/2/12 14:09		298512	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20120626
Lab Code: R1204087-020

Service Request: R1204087
Date Collected: 6/26/12 1115
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	99		mg/L	20	20	NA	6/30/12 08:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1115
Date Received: 6/27/12
Date Analyzed: 6/30/12 09:10

Sample Name: LC34-BW0001D-045.5-20120626
Lab Code: R1204087-020

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0050.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5000	U	5000	230	
79-34-5	1,1,2,2-Tetrachloroethane	5000	U	5000	200	
79-00-5	1,1,2-Trichloroethane	5000	U	5000	230	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	140000		5000	310	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5000	U	5000	200	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5000	U	5000	290	
120-82-1	1,2,4-Trichlorobenzene	5000	U	5000	260	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5000	U	5000	380	
106-93-4	1,2-Dibromoethane	5000	U	5000	200	
95-50-1	1,2-Dichlorobenzene	5000	U	5000	200	
107-06-2	1,2-Dichloroethane	5000	U	5000	200	
78-87-5	1,2-Dichloropropane	5000	U	5000	280	
541-73-1	1,3-Dichlorobenzene	5000	U	5000	200	
106-46-7	1,4-Dichlorobenzene	5000	U	5000	200	
71-36-3	n-Butanol	250000	U	250000	11000	
78-93-3	2-Butanone (MEK)	10000	U	10000	510	
591-78-6	2-Hexanone	10000	U	10000	350	
108-10-1	4-Methyl-2-pentanone	10000	U	10000	270	
67-64-1	Acetone	10000	U	10000	980	
71-43-2	Benzene	5000	U	5000	210	
75-27-4	Bromodichloromethane	5000	U	5000	200	
75-25-2	Bromoform	5000	U	5000	270	
74-83-9	Bromomethane	5000	U	5000	310	
75-15-0	Carbon Disulfide	230	I	10000	200	
56-23-5	Carbon Tetrachloride	5000	U	5000	270	
108-90-7	Chlorobenzene	5000	U	5000	200	
75-00-3	Chloroethane	5000	U	5000	310	
67-66-3	Chloroform	5000	U	5000	220	
74-87-3	Chloromethane	5000	U	5000	240	
110-82-7	Cyclohexane	10000	U	10000	240	
124-48-1	Dibromochloromethane	5000	U	5000	200	
75-71-8	Dichlorodifluoromethane (CFC 12)	5000	U	5000	560	
75-09-2	Dichloromethane	5000	U	5000	220	
100-41-4	Ethylbenzene	5000	U	5000	200	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1115
Date Received: 6/27/12
Date Analyzed: 6/30/12 09:10

Sample Name: LC34-BW0001D-045.5-20120626
Lab Code: R1204087-020

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0050.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1000

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5000	U	5000	200	
79-20-9	Methyl Acetate	10000	U	10000	230	
1634-04-4	Methyl tert-Butyl Ether	5000	U	5000	200	
108-87-2	Methylcyclohexane	10000	U	10000	250	
100-42-5	Styrene	5000	U	5000	200	
127-18-4	Tetrachloroethene (PCE)	5000	U	5000	200	
108-88-3	Toluene	5000	U	5000	200	
79-01-6	Trichloroethene (TCE)	64000		5000	230	
75-69-4	Trichlorofluoromethane (CFC 11)	5000	U	5000	200	
75-01-4	Vinyl Chloride	990	I	5000	230	
156-59-2	cis-1,2-Dichloroethene	7400		5000	200	
10061-01-5	cis-1,3-Dichloropropene	5000	U	5000	200	
179601-23-1	m,p-Xylenes	5000	U	5000	200	
123-86-4	n-Butyl Acetate	5000	U	5000	210	
95-47-6	o-Xylene	5000	U	5000	200	
156-60-5	trans-1,2-Dichloroethene	5000	U	5000	200	
10061-02-6	trans-1,3-Dichloropropene	5000	U	5000	200	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	6/30/12 09:10	
Dibromofluoromethane	94	89-119	6/30/12 09:10	
Toluene-d8	95	87-121	6/30/12 09:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1115
Date Received: 6/27/12
Date Analyzed: 7/2/12 11:56

Sample Name: LC34-BW0001D-045.5-20120626
Lab Code: R1204087-020

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star303.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	89		2.0	
74-85-1	Ethene	25		2.0	
74-82-8	Methane	110		4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120626
Lab Code: R1204087-021

Service Request: R1204087
Date Collected: 6/26/12 1245
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	21.1	mg/L	1.0	1	NA	6/30/12 10:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120626
Lab Code: R1204087-021

Service Request: R1204087
Date Collected: 6/26/12 1245
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/2/12 20:57		298588	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/2/12 20:57		298588	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.6		5.0	0.31	1	NA	7/2/12 20:57		298588	
1,1-Dichloroethane (1,1-DCA)	0.24	I	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/2/12 20:57		298588	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	7/2/12 20:57		298588	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/2/12 20:57		298588	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/2/12 20:57		298588	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
n-Butanol	250	U	250	11	1	NA	7/2/12 20:57		298588	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/2/12 20:57		298588	
2-Hexanone	10	U	10	0.35	1	NA	7/2/12 20:57		298588	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/2/12 20:57		298588	
Acetone	1.6	I	10	0.98	1	NA	7/2/12 20:57		298588	
Benzene	5.0	U	5.0	0.21	1	NA	7/2/12 20:57		298588	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Bromoform	5.0	U	5.0	0.27	1	NA	7/2/12 20:57		298588	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/2/12 20:57		298588	
Carbon Disulfide	7.6	I	10	0.20	1	NA	7/2/12 20:57		298588	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/2/12 20:57		298588	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/2/12 20:57		298588	
Chloroform	5.0	U	5.0	0.22	1	NA	7/2/12 20:57		298588	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/2/12 20:57		298588	
Cyclohexane	10	U	10	0.24	1	NA	7/2/12 20:57		298588	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/2/12 20:57		298588	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/2/12 20:57		298588	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Methyl Acetate	10	U	10	0.23	1	NA	7/2/12 20:57		298588	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120626
Lab Code: R1204087-021

Service Request: R1204087
Date Collected: 6/26/12 1245
Date Received: 6/27/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Methylcyclohexane	10	U	10	0.25	1	NA	7/2/12 20:57		298588	
Styrene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Toluene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Trichloroethene (TCE)	0.50	I	5.0	0.23	1	NA	7/2/12 20:57		298588	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
Vinyl Chloride	600		25	1.2	5	NA	7/2/12 23:42		298588	
cis-1,2-Dichloroethene	59		5.0	0.20	1	NA	7/2/12 20:57		298588	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/2/12 20:57		298588	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	
trans-1,2-Dichloroethene	12		5.0	0.20	1	NA	7/2/12 20:57		298588	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/2/12 20:57		298588	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	7/2/12 20:57	
Dibromofluoromethane	94	89-119	7/2/12 20:57	
Toluene-d8	94	87-121	7/2/12 20:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120626
Lab Code: R1204087-021

Service Request: R1204087
Date Collected: 6/26/12 1245
Date Received: 6/27/12

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	13		10	10	NA	7/2/12 12:11		298512	
Ethene	610		10	10	NA	7/2/12 12:11		298512	
Methane	2200		50	25	NA	7/2/12 14:21		298512	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1245
Date Received: 6/27/12
Date Analyzed: 7/2/12 14:21

Sample Name: LC34-BW0001E-052.5-20120626
Lab Code: R1204087-021
Run Type: Dilution

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star312.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 25

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	25 U	25	
74-85-1	Ethene	510	25	
74-82-8	Methane	2200	50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20120626
Lab Code: R1204087-022

Service Request: R1204087
Date Collected: 6/26/12 1213
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.9		mg/L	1.0	1	NA	6/30/12 11:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1213
Date Received: 6/27/12
Date Analyzed: 7/2/12 21:30

Sample Name: LC34-BW0001F-059.5-20120626
Lab Code: R1204087-022

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0073.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.31 I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	2.4 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1213
Date Received: 6/27/12
Date Analyzed: 7/2/12 21:30

Sample Name: LC34-BW0001F-059.5-20120626
Lab Code: R1204087-022

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0073.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.20	
108-87-2	Methylcyclohexane	10 U	10	0.25	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.20	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	1.2 I	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	13	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	0.99 I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.21	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	7/2/12 21:30	
Dibromofluoromethane	92	89-119	7/2/12 21:30	
Toluene-d8	94	87-121	7/2/12 21:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1213
Date Received: 6/27/12
Date Analyzed: 7/2/12 13:10

Sample Name: LC34-BW0001F-059.5-20120626
Lab Code: R1204087-022

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star308.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	5.0	U	5.0	
74-85-1	Ethene	56		5.0	
74-82-8	Methane	440		10	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20120626
Lab Code: R1204087-023

Service Request: R1204087
Date Collected: 6/26/12 1248
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	2.7		mg/L	1.0	1	NA	7/3/12 23:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1248
Date Received: 6/27/12
Date Analyzed: 7/2/12 22:36

Sample Name: LC34-BW0002A-024.5-20120626
Lab Code: R1204087-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\070212\T0075.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 2.5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13 U	13	0.58	
79-34-5	1,1,2,2-Tetrachloroethane	13 U	13	0.50	
79-00-5	1,1,2-Trichloroethane	13 U	13	0.58	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	210	13	0.78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13 U	13	0.50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13 U	13	0.73	
120-82-1	1,2,4-Trichlorobenzene	13 U	13	0.65	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13 U	13	0.95	
106-93-4	1,2-Dibromoethane	13 U	13	0.50	
95-50-1	1,2-Dichlorobenzene	13 U	13	0.50	
107-06-2	1,2-Dichloroethane	13 U	13	0.50	
78-87-5	1,2-Dichloropropane	13 U	13	0.71	
541-73-1	1,3-Dichlorobenzene	13 U	13	0.50	
106-46-7	1,4-Dichlorobenzene	13 U	13	0.50	
71-36-3	n-Butanol	630 U	630	27	
78-93-3	2-Butanone (MEK)	25 U	25	1.3	
591-78-6	2-Hexanone	25 U	25	0.88	
108-10-1	4-Methyl-2-pentanone	25 U	25	0.68	
67-64-1	Acetone	25 U	25	2.5	
71-43-2	Benzene	13 U	13	0.53	
75-27-4	Bromodichloromethane	13 U	13	0.50	
75-25-2	Bromoform	13 U	13	0.68	
74-83-9	Bromomethane	13 U	13	0.78	
75-15-0	Carbon Disulfide	1.9 I	25	0.50	
56-23-5	Carbon Tetrachloride	13 U	13	0.68	
108-90-7	Chlorobenzene	13 U	13	0.50	
75-00-3	Chloroethane	13 U	13	0.78	
67-66-3	Chloroform	13 U	13	0.55	
74-87-3	Chloromethane	13 U	13	0.60	
110-82-7	Cyclohexane	25 U	25	0.60	
124-48-1	Dibromochloromethane	13 U	13	0.50	
75-71-8	Dichlorodifluoromethane (CFC 12)	13 U	13	1.5	
75-09-2	Dichloromethane	13 U	13	0.55	
100-41-4	Ethylbenzene	13 U	13	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1248
Date Received: 6/27/12
Date Analyzed: 7/2/12 22:36

Sample Name: LC34-BW0002A-024.5-20120626
Lab Code: R1204087-023

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0075.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13	U	13	0.50	
79-20-9	Methyl Acetate	25	U	25	0.58	
1634-04-4	Methyl tert-Butyl Ether	13	U	13	0.50	
108-87-2	Methylcyclohexane	25	U	25	0.63	
100-42-5	Styrene	13	U	13	0.50	
127-18-4	Tetrachloroethene (PCE)	13	U	13	0.50	
108-88-3	Toluene	13	U	13	0.50	
79-01-6	Trichloroethene (TCE)	4.7	I	13	0.58	
75-69-4	Trichlorofluoromethane (CFC 11)	13	U	13	0.50	
75-01-4	Vinyl Chloride	410		13	0.58	
156-59-2	cis-1,2-Dichloroethene	260		13	0.50	
10061-01-5	cis-1,3-Dichloropropene	13	U	13	0.50	
179601-23-1	m,p-Xylenes	13	U	13	0.50	
123-86-4	n-Butyl Acetate	13	U	13	0.53	
95-47-6	o-Xylene	13	U	13	0.50	
156-60-5	trans-1,2-Dichloroethene	34		13	0.50	
10061-02-6	trans-1,3-Dichloropropene	13	U	13	0.50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	89	85-122	7/2/12 22:36	
Dibromofluoromethane	94	89-119	7/2/12 22:36	
Toluene-d8	95	87-121	7/2/12 22:36	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1248
Date Received: 6/27/12
Date Analyzed: 7/2/12 13:37

Sample Name: LC34-BW0002A-024.5-20120626
Lab Code: R1204087-023

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star310.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	2.0	U	2.0	
74-85-1	Ethene	97		2.0	
74-82-8	Methane	92		4.0	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20120626
Lab Code: R1204087-024

Service Request: R1204087
Date Collected: 6/26/12 1212
Date Received: 6/27/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.0		mg/L	1.0	1	NA	6/30/12 12:49	



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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 1212
Date Received: 6/27/12
Date Analyzed: 7/3/12 00:15

Sample Name: LC34-BW0002B-031.5-20120626
Lab Code: R1204087-024

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0078.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50 U	50	2.4	
79-34-5	1,1,2,2-Tetrachloroethane	50 U	50	2.0	
79-00-5	1,1,2-Trichloroethane	50 U	50	2.4	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	130	50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50 U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50 U	50	2.9	
120-82-1	1,2,4-Trichlorobenzene	50 U	50	2.6	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50 U	50	3.8	
106-93-4	1,2-Dibromoethane	50 U	50	2.0	
95-50-1	1,2-Dichlorobenzene	50 U	50	2.0	
107-06-2	1,2-Dichloroethane	50 U	50	2.0	
78-87-5	1,2-Dichloropropane	50 U	50	2.9	
541-73-1	1,3-Dichlorobenzene	50 U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50 U	50	2.0	
71-36-3	n-Butanol	2500 U	2500	110	
78-93-3	2-Butanone (MEK)	100 U	100	5.1	
591-78-6	2-Hexanone	100 U	100	3.5	
108-10-1	4-Methyl-2-pentanone	100 U	100	2.7	
67-64-1	Acetone	100 U	100	9.8	
71-43-2	Benzene	50 U	50	2.1	
75-27-4	Bromodichloromethane	50 U	50	2.0	
75-25-2	Bromoform	50 U	50	2.7	
74-83-9	Bromomethane	50 U	50	3.1	
75-15-0	Carbon Disulfide	8.3 I	100	2.0	
56-23-5	Carbon Tetrachloride	50 U	50	2.7	
108-90-7	Chlorobenzene	50 U	50	2.0	
75-00-3	Chloroethane	50 U	50	3.1	
67-66-3	Chloroform	50 U	50	2.2	
74-87-3	Chloromethane	50 U	50	2.4	
110-82-7	Cyclohexane	100 U	100	2.4	
124-48-1	Dibromochloromethane	50 U	50	2.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	50 U	50	5.7	
75-09-2	Dichloromethane	50 U	50	2.2	
100-41-4	Ethylbenzene	50 U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: 6/26/12 12:12
Date Received: 6/27/12
Date Analyzed: 7/3/12 00:15

Sample Name: LC34-BW0002B-031.5-20120626
Lab Code: R1204087-024

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0078.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	2.4	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.0	
108-87-2	Methylcyclohexane	100	U	100	2.5	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	2.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	16	I	50	2.4	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	820		50	2.4	
156-59-2	cis-1,2-Dichloroethene	1100		50	2.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.0	
179601-23-1	m,p-Xylenes	50	U	50	2.0	
123-86-4	n-Butyl Acetate	50	U	50	2.1	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	67		50	2.0	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	7/3/12 00:15	
Dibromofluoromethane	94	89-119	7/3/12 00:15	
Toluene-d8	94	87-121	7/3/12 00:15	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20120626
Lab Code: R1204087-024

Service Request: R1204087
Date Collected: 6/26/12 1212
Date Received: 6/27/12

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
							Lot	Lot	
Ethane	2.0	U	2.0	2	NA	7/2/12 14:31		298512	
Ethene	100		2.0	2	NA	7/2/12 14:31		298512	
Methane	230		8.0	4	NA	7/2/12 14:41		298512	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204087-MB1

Service Request: R1204087
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	6/29/12 17:34	

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204087-MB2

Service Request: R1204087
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	6/30/12 09:30	



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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204087-MB3

Service Request: R1204087
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	7/3/12 18:11	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/12 12:48

Sample Name: Method Blank
Lab Code: RQ1207342-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0013.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.28 I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/12 12:48

Sample Name: Method Blank
Lab Code: RQ1207342-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0013.D\

Analysis Lot: 298106
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/29/12 12:48	
Dibromofluoromethane	95	89-119	6/29/12 12:48	
Toluene-d8	94	87-121	6/29/12 12:48	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 6/30/12 02:01

Sample Name: Method Blank
Lab Code: RQ1207448-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\062912\T0037.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.39 I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	10 U	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	10 U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 6/30/12 02:01

Sample Name: Method Blank
Lab Code: RQ1207448-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\062912\T0037.D\

Analysis Lot: 298544
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	90	85-122	6/30/12 02:01	
Dibromofluoromethane	93	89-119	6/30/12 02:01	
Toluene-d8	95	87-121	6/30/12 02:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 7/2/12 18:42

Sample Name: Method Blank
Lab Code: RQ1207463-05

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0068.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	0.33	I	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 7/2/12 18:42

Sample Name: Method Blank
Lab Code: RQ1207463-05

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\070212\T0068.D\

Analysis Lot: 298588
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	91	85-122	7/2/12 18:42	
Dibromofluoromethane	95	89-119	7/2/12 18:42	
Toluene-d8	96	87-121	7/2/12 18:42	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 7/3/12 18:53

Sample Name: Method Blank
Lab Code: RQ1207523-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\J9143.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 7/3/12 18:53

Sample Name: Method Blank
Lab Code: RQ1207523-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\J9143.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/3/12 18:53	
Dibromofluoromethane	103	89-119	7/3/12 18:53	
Toluene-d8	97	87-121	7/3/12 18:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 6/29/12 09:32

Sample Name: Method Blank
Lab Code: RQ1207393-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star275.run

Analysis Lot: 298325
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Collected: NA
Date Received: NA
Date Analyzed: 7/2/12 09:42

Sample Name: Method Blank
Lab Code: RQ1207439-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star296.run

Analysis Lot: 298512
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	2.0 U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087

Date Analyzed: 6/29/12

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L

Basis: NA

		Lab Control Sample			
		R1204087-LCS1			
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	9060A	10.2	10.0	102	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087

Date Analyzed: 6/30/12

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1204087-LCS2			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC), Average	9060A	10.6	10.0	106	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087

Date Analyzed: 7/ 3/12

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L

Basis: NA

Analyte Name	Method	Lab Control Sample R1204087-LCS3			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC), Average	9060A	10.5	10.0	105	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 6/29/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298106

Lab Control Sample
RQ1207342-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.7	20.0	94	72 - 128
1,1,2,2-Tetrachloroethane	26.6	20.0	133 *	72 - 131
1,1,2-Trichloroethane	20.9	20.0	104	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.5	20.0	97	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.1	20.0	105	76 - 124
1,1-Dichloroethene (1,1-DCE)	22.6	20.0	113	72 - 129
1,2,4-Trichlorobenzene	23.0	20.0	115	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	26.3	20.0	131	62 - 131
1,2-Dibromoethane	22.9	20.0	114	78 - 125
1,2-Dichlorobenzene	21.4	20.0	107	79 - 124
1,2-Dichloroethane	17.7	20.0	89	73 - 127
1,2-Dichloropropane	20.3	20.0	101	80 - 123
1,3-Dichlorobenzene	21.0	20.0	105	78 - 124
1,4-Dichlorobenzene	20.8	20.0	104	78 - 123
n-Butanol	1200	1010	119	70 - 130
2-Butanone (MEK)	20.8	20.0	104	60 - 133
2-Hexanone	23.9	20.0	120	61 - 131
4-Methyl-2-pentanone	22.6	20.0	113	61 - 132
Acetone	19.7	20.0	98	54 - 139
Benzene	19.7	20.0	98	78 - 121
Bromodichloromethane	19.2	20.0	96	80 - 125
Bromoform	26.1	20.0	131 *	68 - 130
Bromomethane	17.7	20.0	88	57 - 144
Carbon Disulfide	26.0	20.0	130	52 - 140
Carbon Tetrachloride	17.8	20.0	89	68 - 133
Chlorobenzene	20.7	20.0	104	80 - 121
Chloroethane	20.1	20.0	100	71 - 130
Chloroform	20.7	20.0	104	78 - 125
Chloromethane	20.4	20.0	102	61 - 138
Cyclohexane	15.3	20.0	77	57 - 126
Dibromochloromethane	22.0	20.0	110	78 - 133
Dichlorodifluoromethane (CFC 12)	24.4	20.0	122	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 6/29/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298106

**Lab Control Sample
 RQ1207342-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.3	20.0	106	75 - 125
Ethylbenzene	20.0	20.0	100	78 - 123
Isopropylbenzene (Cumene)	20.9	20.0	105	73 - 133
Methyl Acetate	22.7	20.0	113	57 - 157
Methyl tert-Butyl Ether	21.9	20.0	109	75 - 126
Methylcyclohexane	15.8	20.0	79	61 - 125
Styrene	20.0	20.0	100	80 - 132
Tetrachloroethene (PCE)	18.8	20.0	94	72 - 131
Toluene	19.9	20.0	99	78 - 122
Trichloroethene (TCE)	20.2	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	19.5	20.0	98	69 - 141
Vinyl Chloride	20.9	20.0	104	72 - 138
cis-1,2-Dichloroethene	21.9	20.0	110	78 - 122
cis-1,3-Dichloropropene	19.5	20.0	98	77 - 125
m,p-Xylenes	40.4	40.0	101	79 - 126
n-Butyl Acetate	24.3	20.0	121	31 - 144
o-Xylene	19.9	20.0	100	77 - 118
trans-1,2-Dichloroethene	21.9	20.0	110	75 - 121
trans-1,3-Dichloropropene	18.8	20.0	94	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 6/30/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298544

Lab Control Sample
RQ1207448-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.0	20.0	95	72 - 128
1,1,2,2-Tetrachloroethane	24.1	20.0	121	72 - 131
1,1,2-Trichloroethane	19.3	20.0	97	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.6	20.0	103	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.2	20.0	106	76 - 124
1,1-Dichloroethene (1,1-DCE)	24.4	20.0	122	72 - 129
1,2,4-Trichlorobenzene	23.4	20.0	117	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	25.1	20.0	126	62 - 131
1,2-Dibromoethane	21.9	20.0	110	78 - 125
1,2-Dichlorobenzene	20.8	20.0	104	79 - 124
1,2-Dichloroethane	17.3	20.0	86	73 - 127
1,2-Dichloropropane	20.2	20.0	101	80 - 123
1,3-Dichlorobenzene	20.5	20.0	103	78 - 124
1,4-Dichlorobenzene	20.7	20.0	103	78 - 123
n-Butanol	1080	1010	108	70 - 130
2-Butanone (MEK)	18.8	20.0	94	60 - 133
2-Hexanone	21.3	20.0	107	61 - 131
4-Methyl-2-pentanone	20.7	20.0	104	61 - 132
Acetone	20.8	20.0	104	54 - 139
Benzene	20.3	20.0	102	78 - 121
Bromodichloromethane	19.1	20.0	95	80 - 125
Bromoform	23.8	20.0	119	68 - 130
Bromomethane	18.6	20.0	93	57 - 144
Carbon Disulfide	25.9	20.0	129	52 - 140
Carbon Tetrachloride	20.1	20.0	101	68 - 133
Chlorobenzene	20.4	20.0	102	80 - 121
Chloroethane	20.7	20.0	104	71 - 130
Chloroform	20.5	20.0	103	78 - 125
Chloromethane	21.6	20.0	108	61 - 138
Cyclohexane	18.1	20.0	91	57 - 126
Dibromochloromethane	21.0	20.0	105	78 - 133
Dichlorodifluoromethane (CFC 12)	25.4	20.0	127	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 6/30/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298544

**Lab Control Sample
 RQ1207448-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.5	20.0	108	75 - 125
Ethylbenzene	20.6	20.0	103	78 - 123
Isopropylbenzene (Cumene)	21.7	20.0	108	73 - 133
Methyl Acetate	22.4	20.0	112	57 - 157
Methyl tert-Butyl Ether	21.6	20.0	108	75 - 126
Methylcyclohexane	18.1	20.0	90	61 - 125
Styrene	20.2	20.0	101	80 - 132
Tetrachloroethene (PCE)	20.1	20.0	101	72 - 131
Toluene	21.1	20.0	105	78 - 122
Trichloroethene (TCE)	22.1	20.0	111	74 - 127
Trichlorofluoromethane (CFC 11)	20.6	20.0	103	69 - 141
Vinyl Chloride	22.4	20.0	112	72 - 138
cis-1,2-Dichloroethene	21.7	20.0	109	78 - 122
cis-1,3-Dichloropropene	18.7	20.0	94	77 - 125
m,p-Xylenes	42.0	40.0	105	79 - 126
n-Butyl Acetate	21.7	20.0	109	31 - 144
o-Xylene	20.5	20.0	102	77 - 118
trans-1,2-Dichloroethene	22.8	20.0	114	75 - 121
trans-1,3-Dichloropropene	17.8	20.0	89	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087

Date Analyzed: 7/ 2/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 298588

Analyte Name	Lab Control Sample RQ1207463-03			Duplicate Lab Control Sample RQ1207463-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	20.0	20.0	100	20.0	20.0	100	72 - 128	<1	30
1,1,2,2-Tetrachloroethane	22.2	20.0	111	22.5	20.0	113	72 - 131	1	30
1,1,2-Trichloroethane	19.4	20.0	97	19.1	20.0	95	80 - 122	2	30
1,1,2-Trichloro-1,2,2-trifluoroethane	21.1	20.0	105	21.9	20.0	109	68 - 136	4	30
1,1-Dichloroethane (1,1-DCA)	22.0	20.0	110	22.4	20.0	112	76 - 124	2	30
1,1-Dichloroethene (1,1-DCE)	24.9	20.0	124	24.8	20.0	124	72 - 129	<1	30
1,2,4-Trichlorobenzene	23.3	20.0	116	21.7	20.0	109	70 - 133	7	30
1,2-Dibromo-3-chloropropane (DBCP)	21.5	20.0	108	19.9	20.0	100	62 - 131	8	30
1,2-Dibromoethane	20.6	20.0	103	20.6	20.0	103	78 - 125	<1	30
1,2-Dichlorobenzene	20.5	20.0	102	20.9	20.0	104	79 - 124	2	30
1,2-Dichloroethane	16.8	20.0	84	17.8	20.0	89	73 - 127	6	30
1,2-Dichloropropane	20.2	20.0	101	20.6	20.0	103	80 - 123	2	30
1,3-Dichlorobenzene	21.3	20.0	106	21.1	20.0	105	78 - 124	<1	30
1,4-Dichlorobenzene	21.1	20.0	105	20.6	20.0	103	78 - 123	2	30
n-Butanol	899	1010	89	876	1010	87	70 - 130	3	30
2-Butanone (MEK)	16.5	20.0	82	17.9	20.0	90	60 - 133	9	30
2-Hexanone	18.0	20.0	90	17.6	20.0	88	61 - 131	2	30
4-Methyl-2-pentanone	18.3	20.0	91	18.6	20.0	93	61 - 132	2	30
Acetone	17.1	20.0	85	18.2	20.0	91	54 - 139	6	30
Benzene	20.5	20.0	103	21.0	20.0	105	78 - 121	2	30
Bromodichloromethane	19.6	20.0	98	19.7	20.0	99	80 - 125	<1	30
Bromoform	24.0	20.0	120	23.4	20.0	117	68 - 130	3	30
Bromomethane	16.5	20.0	83	16.6	20.0	83	57 - 144	<1	30
Carbon Disulfide	29.2	20.0	146 *	29.6	20.0	148 *	52 - 140	1	30
Carbon Tetrachloride	19.7	20.0	98	21.3	20.0	107	68 - 133	8	30
Chlorobenzene	20.7	20.0	103	20.9	20.0	105	80 - 121	1	30
Chloroethane	21.6	20.0	108	23.0	20.0	115	71 - 130	7	30
Chloroform	20.9	20.0	105	21.3	20.0	107	78 - 125	2	30
Chloromethane	21.6	20.0	108	21.5	20.0	107	61 - 138	<1	30
Cyclohexane	19.1	20.0	96	19.3	20.0	96	57 - 126	<1	30
Dibromochloromethane	20.8	20.0	104	21.1	20.0	105	78 - 133	1	30
Dichlorodifluoromethane (CFC 12)	25.5	20.0	127	25.4	20.0	127	45 - 159	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 7/2/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298588

Analyte Name	Lab Control Sample RQ1207463-03			Duplicate Lab Control Sample RQ1207463-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	22.0	20.0	110	22.0	20.0	110	75 - 125	<1	30
Ethylbenzene	20.7	20.0	104	20.5	20.0	103	78 - 123	1	30
Isopropylbenzene (Cumene)	21.9	20.0	109	22.1	20.0	110	73 - 133	<1	30
Methyl Acetate	17.0	20.0	85	17.9	20.0	90	57 - 157	5	30
Methyl tert-Butyl Ether	20.1	20.0	101	20.5	20.0	103	75 - 126	2	30
Methylcyclohexane	20.1	20.0	100	20.7	20.0	103	61 - 125	3	30
Styrene	19.9	20.0	99	20.6	20.0	103	80 - 132	4	30
Tetrachloroethene (PCE)	20.6	20.0	103	20.3	20.0	101	72 - 131	2	30
Toluene	20.8	20.0	104	21.3	20.0	107	78 - 122	2	30
Trichloroethene (TCE)	21.1	20.0	106	22.5	20.0	113	74 - 127	6	30
Trichlorofluoromethane (CFC 11)	21.1	20.0	105	20.8	20.0	104	69 - 141	1	30
Vinyl Chloride	22.8	20.0	114	22.8	20.0	114	72 - 138	<1	30
cis-1,2-Dichloroethene	22.3	20.0	111	22.6	20.0	113	78 - 122	2	30
cis-1,3-Dichloropropene	18.8	20.0	94	19.2	20.0	96	77 - 125	2	30
m,p-Xylenes	41.1	40.0	103	41.6	40.0	104	79 - 126	1	30
n-Butyl Acetate	20.0	20.0	100	20.1	20.0	100	31 - 144	<1	30
o-Xylene	20.5	20.0	103	20.4	20.0	102	77 - 118	<1	30
trans-1,2-Dichloroethene	22.9	20.0	115	23.2	20.0	116	75 - 121	1	30
trans-1,3-Dichloropropene	18.1	20.0	90	18.9	20.0	94	69 - 127	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 7/ 3/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298776

Lab Control Sample
RQ1207523-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.4	20.0	107	72 - 128
1,1,2,2-Tetrachloroethane	19.6	20.0	98	72 - 131
1,1,2-Trichloroethane	19.5	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.0	20.0	105	68 - 136
1,1-Dichloroethane (1,1-DCA)	23.2	20.0	116	76 - 124
1,1-Dichloroethene (1,1-DCE)	23.3	20.0	117	72 - 129
1,2,4-Trichlorobenzene	18.2	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.2	20.0	86	62 - 131
1,2-Dibromoethane	19.3	20.0	96	78 - 125
1,2-Dichlorobenzene	19.1	20.0	96	79 - 124
1,2-Dichloroethane	22.7	20.0	113	73 - 127
1,2-Dichloropropane	21.1	20.0	106	80 - 123
1,3-Dichlorobenzene	19.8	20.0	99	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	1120	1010	112	70 - 130
2-Butanone (MEK)	21.7	20.0	109	60 - 133
2-Hexanone	20.4	20.0	102	61 - 131
4-Methyl-2-pentanone	20.8	20.0	104	61 - 132
Acetone	21.2	20.0	106	54 - 139
Benzene	20.3	20.0	102	78 - 121
Bromodichloromethane	20.5	20.0	102	80 - 125
Bromoform	18.9	20.0	94	68 - 130
Bromomethane	20.4	20.0	102	57 - 144
Carbon Disulfide	24.7	20.0	124	52 - 140
Carbon Tetrachloride	21.2	20.0	106	68 - 133
Chlorobenzene	20.1	20.0	100	80 - 121
Chloroethane	22.2	20.0	111	71 - 130
Chloroform	22.4	20.0	112	78 - 125
Chloromethane	21.7	20.0	108	61 - 138
Cyclohexane	21.2	20.0	106	57 - 126
Dibromochloromethane	19.5	20.0	97	78 - 133
Dichlorodifluoromethane (CFC 12)	21.7	20.0	108	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087

Date Analyzed: 7/3/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 298776

**Lab Control Sample
 RQ1207523-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	22.1	20.0	111	75 - 125
Ethylbenzene	19.9	20.0	99	78 - 123
Isopropylbenzene (Cumene)	19.9	20.0	100	73 - 133
Methyl Acetate	19.8	20.0	99	57 - 157
Methyl tert-Butyl Ether	21.3	20.0	107	75 - 126
Methylcyclohexane	21.5	20.0	108	61 - 125
Styrene	19.9	20.0	99	80 - 132
Tetrachloroethene (PCE)	20.1	20.0	101	72 - 131
Toluene	19.3	20.0	97	78 - 122
Trichloroethene (TCE)	20.2	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	21.7	20.0	108	69 - 141
Vinyl Chloride	22.7	20.0	113	72 - 138
cis-1,2-Dichloroethene	21.8	20.0	109	78 - 122
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	40.1	40.0	100	79 - 126
n-Butyl Acetate	19.8	20.0	99	31 - 144
o-Xylene	20.2	20.0	101	77 - 118
trans-1,2-Dichloroethene	22.1	20.0	111	75 - 121
trans-1,3-Dichloropropene	19.6	20.0	98	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 6/29/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 298325

Analyte Name	Lab Control Sample RQ1207393-02			Duplicate Lab Control Sample RQ1207393-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.7	26.0	103	30.6	26.0	118	56 - 148	13	20
Ethene	23.9	24.3	98	27.4	24.3	113	58 - 155	14	20
Methane	27.4	26.2	105	31.3	26.2	119	55 - 150	13	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/26/12
Sample Matrix: Water

Service Request: R1204087
Date Analyzed: 7/2/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 298512

Lab Control Sample
RQ1207439-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	25.3	26.0	97	56 - 148
Ethene	22.6	24.3	93	58 - 155
Methane	25.4	26.2	97	55 - 150

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services


1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: [Signature]

Sample ID.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	TOC (9060A)	MES (RSK 175)	REMARKS
LC34-1W0070D-040.5-20120626	6/26/2012	0938	001	W	3	3			
LC34-1W0070D1-070.0-20120626	6/26/2012	0908	002	W	3	3			
LC34-1W0071D-040.5-20120626	6/26/2012	1016	003	W	3	3			
LC34-1W0071D-040.5-20120626	6/26/2012	0911	004	W	3	3			
LC34-1W0071D1-070.0-20120626	6/26/2012	1011	004	W	3	3			
				W	0	0			
				W	0	0			
				W	0	0			
				W	0	0			

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 X ___ Standard (15 BD) ___
 Provide FAX Preliminary Results
 Requested Report Date: X ___
 Invoice Information
 P.O. # ___
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

Comments/Special Instructions:
R1204087 5
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B 6/26/12


RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Rebecca Daprato
 Firm: Geosyntec
 Date/Time: 6/26/12 - 1700


RECEIVED BY:
 Signature: [Signature]
 Printed Name: Benjamin Hatten
 Firm: URS
 Date/Time: 6/27/12 0940

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: *[Signature]*

Sample ID	Date	Time	LAB ID	Matrix	Analysis Requested																			
					VOCs (260C) plus n-butyl acetate	TOC (9060A)	MEEs (RSK 175)								REMARKS									
LC34-BW0002C-038.5-20120626	6/26/2012	1123	-005	W	15	3	1	1	3	1	1	1	1	1										
LC34-BW0002D-045.5-20120626	6/26/2012	1044	-006	W	15	3	1	1	3	1	1	1	1	1										
LC34-BW0002E-052.5-20120626	6/26/2012	1000	-007	W	15	3	1	1	3	1	1	1	1	1										
LC34-BW0002F-059.5-20120626	6/26/2012	0917	-008	W	15	3	1	1	3	1	1	1	1	1										
LC34-1W0076-075.0-20120626	6/26/2012	1333	-009	W	9	3	3	3																
LC34-1W0002I-027.5-20120626	6/26/2012	1414	-010	W	9	3	3	3																
LC34-1W0002J-037.5-20120626	6/26/2012	1419	-011	W	9	3	3	3																
LC34-1W0002K-052.5-20120626	6/26/2012	1333	-012	W	9	3	3	3																
LC34-1W0067D-040.5-20120626	6/26/2012	1210	-013	W	3	3																		
LC34-1W0067D1-068.0-20120626	6/26/2012	1139	-014	W	3	3																		

Comments/Special Instructions:
R1204087
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B 6/26/12


REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank
 (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD? NASA KEDD

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 6/26/12 1700

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 6/26/12 1700

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Joseph Bartlett
 Firm: Geosyntec
 Date/Time: 6/26/12 0940

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: [Signature]

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260) plus n-butyl acetate	TOC (9060A)	MEEs (RSK 175)	REMARKS
LC34-RW0007-038.5-20120626	6/26/2012	1326	-015	W	9	3	3	3	
LC34-RW0008-052.0-20120626	6/26/2012	1416	-016	W	9	3	3	3	
LC34-BW0001A-024.5-20120626	6/26/2012	0960	-017	W	8	3	2	3	
LC34-BW0001B-031.5-20120626	6/26/2012	0945	-018	W	9	3	3	3	
LC34-BW0001C-038.5-20120626	6/26/2012	1035	-019	W	9	3	3	3	
LC34-BW0001D-045.5-20120626	6/26/2012	1115	-020	W	9	3	3	3	
LC34-BW0001E-052.5-20120626	6/26/2012	1245	-021	W	9	3	3	3	
LC34-BW0001F-059.5-20120626	6/26/2012	1213	-022	W	9	3	3	3	
LC34-BW0002A-024.5-20120626	6/26/2012	1248	-023	W	9	3	3	3	
LC34-BW0002B-031.5-20120626	6/26/2012	1212	-024	W	9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BP)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?; NASA KEDD

Comments/Special Instructions:
R1204087

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: JOSEPH BARRETT
 Firm: GEOSYNTEC
 Date/Time: 6/26/12 - 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: REBECCA DAPRATO
 Firm: GEOSYNTEC
 Date/Time: 6/26/12 - 1700

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Geosyntec
 Firm: HI
 Date/Time: 6/27/12 0940



Cooler Receipt and Preservation Check Form

Project/Client Neosyntex Folder Number R1204087

Cooler received on 6/27/12 by: JD COURIER: ALS · UPS ~~FEDEX~~ VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/ROC, CLIENT
 - Temperature of cooler(s) upon receipt: 2.1° 2.6° 2.0° _____
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
- If No, Explain Below No No No No No

Date/Time Temperatures Taken: 6/27/12 0943

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location _____ by _____ on _____ at _____
5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: US 6/27/12

Cooler Breakdown: Date: 6/27/12 Time: 1305 by: DN

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
 - Did all bottle labels and tags agree with custody papers? YES NO
 - Were correct containers used for the tests indicated? YES NO
 - Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A
- Explain any discrepancies: _____

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			WC112015C	6/13				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	4111060	1/13				

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: 2-059-001, 2-059-002, 2-059-003

Other Comments: Bubbles: 1W0002D1 (1 vial)
1W0076 (1 vial)
RW0007 (1 vial)

PC Secondary Review: VB 7/13/12 *significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



July 17, 2012

Service Request No: R1204170

Dr. Rebecca Daprato
GeoSyntec Consultants
2692 Madison Rd
Suite N1 #223
Cincinnati, OH 45208

Laboratory Results for: ESTCP PED LC34 FO0552B 6/27/12

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on June 29, 2012. For your reference, these analyses have been assigned our service request number **R1204170**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 49



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO0552B (6/27/12)
Sample Matrix: Water

Service Request No.: R1204170
Date Received: 6/29/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Seven (7) water samples were collected by the client on 6/27/12 and were received for analysis at Columbia Analytical Services on 6/29/12 via a national courier. The samples were received at a cooler temperature of 10.7°C, outside the guidelines of 0-6°C. The client was notified via the Sample Confirmation and permission was given to proceed with the analyses. The chain of custody forms were consistent with the samples received. Bubbles were noted in 1 vial each of 2 different locations as noted on the Cooler Receipt and Preservation Check Form.

Volatile Organic Compounds GC/MS

Seven (7) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C. Six (6) samples were also analyzed for GC Method RSK-175.

The Initial Calibration and Continuing Calibration criteria was met for all samples.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "P", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Inorganics

Six (6) water samples were analyzed for TOC analysis by method 9060A.

All initial and continuing calibration criteria were met.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were within acceptance limits.

All Method Blanks were free from contamination.

All samples were analyzed within the proper holding time.

No problems were encountered during the analysis of these samples.

Approved by Kevin Burkow Date 7/17/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1204170

<u>Lab ID</u>	<u>Client ID</u>
R1204170-001	LC34-BW0003A-024.5-20120627
R1204170-002	LC34-BW0003B-031.5-20120627
R1204170-003	LC34-BW0003C-038.5-20120627
R1204170-004	LC34-BW0003D-045.5-20120627
R1204170-005	LC34-BW0003E-052.5-20120627
R1204170-006	LC34-BW0003F-059.5-20120627
R1204170-007	LC34-1DW-188680-20120627

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20120627
Lab Code: R1204170-001

Service Request: R1204170
Date Collected: 6/27/12 0955
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.4		mg/L	1.0	1	NA	7/4/12 07:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 0955
Date Received: 6/29/12
Date Analyzed: 7/2/12 21:05

Sample Name: LC34-BW0003A-024.5-20120627
Lab Code: R1204170-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9109.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2500		250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	13000	U	13000	530	
78-93-3	2-Butanone (MEK)	500	U	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	500	U	500	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	500	U	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	250	U	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	250	U	250	11	
100-41-4	Ethylbenzene	250	U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 0955
Date Received: 6/29/12
Date Analyzed: 7/2/12 21:05

Sample Name: LC34-BW0003A-024.5-20120627
Lab Code: R1204170-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9109.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500 U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250 U	250	10	
108-87-2	Methylcyclohexane	500 U	500	13	
100-42-5	Styrene	250 U	250	10	
127-18-4	Tetrachloroethene (PCE)	250 U	250	10	
108-88-3	Toluene	250 U	250	10	
79-01-6	Trichloroethene (TCE)	250 U	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250 U	250	10	
75-01-4	Vinyl Chloride	560	250	12	
156-59-2	cis-1,2-Dichloroethene	5200	250	10	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	10	
179601-23-1	m,p-Xylenes	250 U	250	10	
123-86-4	n-Butyl Acetate	250 U	250	11	
95-47-6	o-Xylene	250 U	250	10	
156-60-5	trans-1,2-Dichloroethene	220 I	250	10	
10061-02-6	trans-1,3-Dichloropropene	250 U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/2/12 21:05	
Dibromofluoromethane	103	89-119	7/2/12 21:05	
Toluene-d8	99	87-121	7/2/12 21:05	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 0955
Date Received: 6/29/12
Date Analyzed: 7/3/12 10:20

Sample Name: LC34-BW0003A-024.5-20120627
Lab Code: R1204170-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star322.run

Analysis Lot: 298647
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.1		1.0	
74-85-1	Ethene	24		1.0	
74-82-8	Methane	82		2.0	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20120627
Lab Code: R1204170-002

Service Request: R1204170
Date Collected: 6/27/12 1022
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.6	mg/L	1.0	1	NA	7/4/12 08:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1022
Date Received: 6/29/12
Date Analyzed: 7/3/12 20:48

Sample Name: LC34-BW0003B-031.5-20120627
Lab Code: R1204170-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\J9146.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	190	I	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	13000	U	13000	530	
78-93-3	2-Butanone (MEK)	500	U	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	500	U	500	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	500	U	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	250	U	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	250	U	250	11	
100-41-4	Ethylbenzene	250	U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1022
Date Received: 6/29/12
Date Analyzed: 7/3/12 20:48

Sample Name: LC34-BW0003B-031.5-20120627
Lab Code: R1204170-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\U9146.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	250	U	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	1000		250	12	
156-59-2	cis-1,2-Dichloroethene	6600		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	250	U	250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	270		250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	7/3/12 20:48	
Dibromofluoromethane	105	89-119	7/3/12 20:48	
Toluene-d8	98	87-121	7/3/12 20:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1022
Date Received: 6/29/12
Date Analyzed: 7/3/12 10:34

Sample Name: LC34-BW0003B-031.5-20120627
Lab Code: R1204170-002

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star323.run

Analysis Lot: 298647
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	20		1.0	
74-82-8	Methane	76		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120627
Lab Code: R1204170-003

Service Request: R1204170
Date Collected: 6/27/12 1056
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	4.2		mg/L	1.0	1	NA	7/4/12 08:47	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120627
Lab Code: R1204170-003

Service Request: R1204170
Date Collected: 6/27/12 1056
Date Received: 6/29/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	7/2/12 22:22		298582	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,1,2-Trichloroethane	500	U	500	23	100	NA	7/2/12 22:22		298582	
1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	31	100	NA	7/2/12 22:22		298582	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	7/2/12 22:22		298582	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	7/2/12 22:22		298582	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	7/2/12 22:22		298582	
1,2-Dibromoethane	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,2-Dichlorobenzene	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,2-Dichloroethane	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,2-Dichloropropane	500	U	500	29	100	NA	7/2/12 22:22		298582	
1,3-Dichlorobenzene	500	U	500	20	100	NA	7/2/12 22:22		298582	
1,4-Dichlorobenzene	500	U	500	20	100	NA	7/2/12 22:22		298582	
n-Butanol	25000	U	25000	1100	100	NA	7/2/12 22:22		298582	
2-Butanone (MEK)	1000	U	1000	51	100	NA	7/2/12 22:22		298582	
2-Hexanone	1000	U	1000	35	100	NA	7/2/12 22:22		298582	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	7/2/12 22:22		298582	
Acetone	1000	U	1000	98	100	NA	7/2/12 22:22		298582	
Benzene	500	U	500	21	100	NA	7/2/12 22:22		298582	
Bromodichloromethane	500	U	500	20	100	NA	7/2/12 22:22		298582	
Bromoform	500	U	500	27	100	NA	7/2/12 22:22		298582	
Bromomethane	500	U	500	31	100	NA	7/2/12 22:22		298582	
Carbon Disulfide	1000	U	1000	20	100	NA	7/2/12 22:22		298582	
Carbon Tetrachloride	500	U	500	27	100	NA	7/2/12 22:22		298582	
Chlorobenzene	500	U	500	20	100	NA	7/2/12 22:22		298582	
Chloroethane	500	U	500	31	100	NA	7/2/12 22:22		298582	
Chloroform	500	U	500	22	100	NA	7/2/12 22:22		298582	
Chloromethane	500	U	500	24	100	NA	7/2/12 22:22		298582	
Cyclohexane	1000	U	1000	24	100	NA	7/2/12 22:22		298582	
Dibromochloromethane	500	U	500	20	100	NA	7/2/12 22:22		298582	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	7/2/12 22:22		298582	
Dichloromethane	500	U	500	22	100	NA	7/2/12 22:22		298582	
Ethylbenzene	500	U	500	20	100	NA	7/2/12 22:22		298582	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	7/2/12 22:22		298582	
Methyl Acetate	1000	U	1000	23	100	NA	7/2/12 22:22		298582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120627
Lab Code: R1204170-003

Service Request: R1204170
Date Collected: 6/27/12 1056
Date Received: 6/29/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	7/2/12 22:22		298582	
Methylcyclohexane	1000	U	1000	25	100	NA	7/2/12 22:22		298582	
Styrene	500	U	500	20	100	NA	7/2/12 22:22		298582	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	7/2/12 22:22		298582	
Toluene	500	U	500	20	100	NA	7/2/12 22:22		298582	
Trichloroethene (TCE)	500	U	500	23	100	NA	7/2/12 22:22		298582	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	7/2/12 22:22		298582	
Vinyl Chloride	8600		500	23	100	NA	7/2/12 22:22		298582	
cis-1,2-Dichloroethene	22000		1000	40	200	NA	7/3/12 21:26		298776	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	7/2/12 22:22		298582	
m,p-Xylenes	500	U	500	20	100	NA	7/2/12 22:22		298582	
n-Butyl Acetate	500	U	500	21	100	NA	7/2/12 22:22		298582	
o-Xylene	500	U	500	20	100	NA	7/2/12 22:22		298582	
trans-1,2-Dichloroethene	840		500	20	100	NA	7/2/12 22:22		298582	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	7/2/12 22:22		298582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/2/12 22:22	
Dibromofluoromethane	103	89-119	7/2/12 22:22	
Toluene-d8	99	87-121	7/2/12 22:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1056
Date Received: 6/29/12
Date Analyzed: 7/3/12 10:44

Sample Name: LC34-BW0003C-038.5-20120627
Lab Code: R1204170-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star324.run

Analysis Lot: 298647
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	13		10	
74-85-1	Ethene	620		10	
74-82-8	Methane	210		20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20120627
Lab Code: R1204170-004

Service Request: R1204170
Date Collected: 6/27/12 1135
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	59		mg/L	10	10	NA	7/4/12 11:26	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 6/27/12
 Sample Matrix: Water

Service Request: R1204170
 Date Collected: 6/27/12 1135
 Date Received: 6/29/12
 Date Analyzed: 7/2/12 23:00

Sample Name: LC34-BW0003D-045.5-20120627
 Lab Code: R1204170-004

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9112.D\

Analysis Lot: 298582
 Instrument Name: R-MS-07
 Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	130	U	130	5.8	
79-34-5	1,1,2,2-Tetrachloroethane	130	U	130	5.0	
79-00-5	1,1,2-Trichloroethane	130	U	130	5.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	45	I	130	7.8	
75-34-3	1,1-Dichloroethane (1,1-DCA)	130	U	130	5.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	130	U	130	7.3	
120-82-1	1,2,4-Trichlorobenzene	130	U	130	6.5	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	130	U	130	9.5	
106-93-4	1,2-Dibromoethane	130	U	130	5.0	
95-50-1	1,2-Dichlorobenzene	130	U	130	5.0	
107-06-2	1,2-Dichloroethane	130	U	130	5.0	
78-87-5	1,2-Dichloropropane	130	U	130	7.1	
541-73-1	1,3-Dichlorobenzene	130	U	130	5.0	
106-46-7	1,4-Dichlorobenzene	130	U	130	5.0	
71-36-3	n-Butanol	6300	U	6300	270	
78-93-3	2-Butanone (MEK)	250	U	250	13	
591-78-6	2-Hexanone	250	U	250	8.8	
108-10-1	4-Methyl-2-pentanone	250	U	250	6.8	
67-64-1	Acetone	250	U	250	25	
71-43-2	Benzene	130	U	130	5.3	
75-27-4	Bromodichloromethane	130	U	130	5.0	
75-25-2	Bromoform	130	U	130	6.8	
74-83-9	Bromomethane	130	U	130	7.8	
75-15-0	Carbon Disulfide	6.0	I	250	5.0	
56-23-5	Carbon Tetrachloride	130	U	130	6.8	
108-90-7	Chlorobenzene	130	U	130	5.0	
75-00-3	Chloroethane	130	U	130	7.8	
67-66-3	Chloroform	130	U	130	5.5	
74-87-3	Chloromethane	130	U	130	6.0	
110-82-7	Cyclohexane	250	U	250	6.0	
124-48-1	Dibromochloromethane	130	U	130	5.0	
75-71-8	Dichlorodifluoromethane (CFC 12)	130	U	130	15	
75-09-2	Dichloromethane	130	U	130	5.5	
100-41-4	Ethylbenzene	130	U	130	5.0	
98-82-8	Isopropylbenzene (Cumene)	130	U	130	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1135
Date Received: 6/29/12
Date Analyzed: 7/2/12 23:00

Sample Name: LC34-BW0003D-045.5-20120627
Lab Code: R1204170-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9112.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	250	U	250	5.8	
1634-04-4	Methyl tert-Butyl Ether	130	U	130	5.0	
108-87-2	Methylcyclohexane	250	U	250	6.3	
100-42-5	Styrene	130	U	130	5.0	
127-18-4	Tetrachloroethene (PCE)	130	U	130	5.0	
108-88-3	Toluene	130	U	130	5.0	
79-01-6	Trichloroethene (TCE)	130	U	130	5.8	
75-69-4	Trichlorofluoromethane (CFC 11)	130	U	130	5.0	
75-01-4	Vinyl Chloride	4000		130	5.8	
156-59-2	cis-1,2-Dichloroethene	360		130	5.0	
10061-01-5	cis-1,3-Dichloropropene	130	U	130	5.0	
179601-23-1	m,p-Xylenes	130	U	130	5.0	
123-86-4	n-Butyl Acetate	130	U	130	5.3	
95-47-6	o-Xylene	130	U	130	5.0	
156-60-5	trans-1,2-Dichloroethene	65	I	130	5.0	
10061-02-6	trans-1,3-Dichloropropene	130	U	130	5.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/2/12 23:00	
Dibromofluoromethane	102	89-119	7/2/12 23:00	
Toluene-d8	97	87-121	7/2/12 23:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1135
Date Received: 6/29/12
Date Analyzed: 7/3/12 10:56

Sample Name: LC34-BW0003D-045.5-20120627
Lab Code: R1204170-004

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star325.run

Analysis Lot: 298647
Instrument Name: R-GC-02
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	26		25	
74-85-1	Ethene	910		25	
74-82-8	Methane	1400		50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20120627
Lab Code: R1204170-005

Service Request: R1204170
Date Collected: 6/27/12 1250
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average 9060A		42.1	mg/L	4.0	4	NA	7/4/12 12:06	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1250
Date Received: 6/29/12
Date Analyzed: 7/3/12 19:31

Sample Name: LC34-BW0003E-052.5-20120627
Lab Code: R1204170-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\J9144.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	0.46 I	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	11	
78-93-3	2-Butanone (MEK)	10 U	10	0.51	
591-78-6	2-Hexanone	10 U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.27	
67-64-1	Acetone	4.3 I	10	0.98	
71-43-2	Benzene	5.0 U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.20	
75-25-2	Bromoform	5.0 U	5.0	0.27	
74-83-9	Bromomethane	5.0 U	5.0	0.31	
75-15-0	Carbon Disulfide	1.5 I	10	0.20	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.27	
108-90-7	Chlorobenzene	5.0 U	5.0	0.20	
75-00-3	Chloroethane	5.0 U	5.0	0.31	
67-66-3	Chloroform	5.0 U	5.0	0.22	
74-87-3	Chloromethane	5.0 U	5.0	0.24	
110-82-7	Cyclohexane	10 U	10	0.24	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	
75-09-2	Dichloromethane	5.0 U	5.0	0.22	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1250
Date Received: 6/29/12
Date Analyzed: 7/3/12 19:31

Sample Name: LC34-BW0003E-052.5-20120627
Lab Code: R1204170-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070312\J9144.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	66		5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	4.2	I	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	27		5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	4.8	I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/3/12 19:31	
Dibromofluoromethane	102	89-119	7/3/12 19:31	
Toluene-d8	99	87-121	7/3/12 19:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20120627
Lab Code: R1204170-005

Service Request: R1204170
Date Collected: 6/27/12 1250
Date Received: 6/29/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	18		5.0	5	NA	7/3/12 11:06		298647	
Ethene	850		20	20	NA	7/3/12 12:08		298647	
Methane	680		40	20	NA	7/3/12 12:08		298647	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20120627
Lab Code: R1204170-006

Service Request: R1204170
Date Collected: 6/27/12 1323
Date Received: 6/29/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	4.5		mg/L	1.0	1	NA	7/10/12 17:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 6/27/12
 Sample Matrix: Water

Service Request: R1204170
 Date Collected: 6/27/12 1323
 Date Received: 6/29/12
 Date Analyzed: 7/2/12 20:27

Sample Name: LC34-BW0003F-059.5-20120627
 Lab Code: R1204170-006

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUATA\MSVOA7\DATA\070212\J9108.D\

Analysis Lot: 298582
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	66		5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	1.5	I	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1323
Date Received: 6/29/12
Date Analyzed: 7/2/12 20:27

Sample Name: LC34-BW0003F-059.5-20120627
Lab Code: R1204170-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9108.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	26		5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	0.91	I	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	15		5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	0.43	I	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	7/2/12 20:27	
Dibromofluoromethane	102	89-119	7/2/12 20:27	
Toluene-d8	98	87-121	7/2/12 20:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20120627
Lab Code: R1204170-006

Service Request: R1204170
Date Collected: 6/27/12 1323
Date Received: 6/29/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	10	U	10	10	NA	7/3/12 11:44		298647	
Ethene	85		10	10	NA	7/3/12 11:44		298647	
Methane	1300		40	20	NA	7/3/12 12:21		298647	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 6/27/12
 Sample Matrix: Water

Service Request: R1204170
 Date Collected: 6/27/12 1410
 Date Received: 6/29/12
 Date Analyzed: 7/2/12 19:11

Sample Name: LC34-1DW-188680-20120627
 Lab Code: R1204170-007

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9106.D\

Analysis Lot: 298582
 Instrument Name: R-MS-07
 Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	12	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	10	
79-00-5	1,1,2-Trichloroethane	250	U	250	12	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	89	I	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	21	I	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	15	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	13	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	19	
106-93-4	1,2-Dibromoethane	250	U	250	10	
95-50-1	1,2-Dichlorobenzene	250	U	250	10	
107-06-2	1,2-Dichloroethane	250	U	250	10	
78-87-5	1,2-Dichloropropane	250	U	250	15	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	1500	I	13000	530	
78-93-3	2-Butanone (MEK)	500	U	500	26	
591-78-6	2-Hexanone	500	U	500	18	
108-10-1	4-Methyl-2-pentanone	500	U	500	14	
67-64-1	Acetone	170	I	500	49	
71-43-2	Benzene	250	U	250	11	
75-27-4	Bromodichloromethane	250	U	250	10	
75-25-2	Bromoform	250	U	250	14	
74-83-9	Bromomethane	250	U	250	16	
75-15-0	Carbon Disulfide	73	I	500	10	
56-23-5	Carbon Tetrachloride	250	U	250	14	
108-90-7	Chlorobenzene	250	U	250	10	
75-00-3	Chloroethane	250	U	250	16	
67-66-3	Chloroform	250	U	250	11	
74-87-3	Chloromethane	250	U	250	12	
110-82-7	Cyclohexane	500	U	500	12	
124-48-1	Dibromochloromethane	250	U	250	10	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	29	
75-09-2	Dichloromethane	250	U	250	11	
100-41-4	Ethylbenzene	250	U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: 6/27/12 1410
Date Received: 6/29/12
Date Analyzed: 7/2/12 19:11

Sample Name: LC34-1DW-188680-20120627
Lab Code: R1204170-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA7\DATA\070212\J9106.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	12	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	10	
108-87-2	Methylcyclohexane	500	U	500	13	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	10	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	65	I	250	12	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	3600		250	12	
156-59-2	cis-1,2-Dichloroethene	270		250	10	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	10	
179601-23-1	m,p-Xylenes	250	U	250	10	
123-86-4	n-Butyl Acetate	9500		250	11	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	240	I	250	10	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	7/2/12 19:11	
Dibromofluoromethane	101	89-119	7/2/12 19:11	
Toluene-d8	99	87-121	7/2/12 19:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204170-MB1

Service Request: R1204170
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average 9060A		1.0 U	mg/L	1.0	1	NA	7/3/12 18:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204170-MB2

Service Request: R1204170
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	7/4/12 10:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1204170-MB3

Service Request: R1204170
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	7/10/12 16:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 6/27/12
 Sample Matrix: Water

Service Request: R1204170
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 7/2/12 17:54

Sample Name: Method Blank
 Lab Code: RQ1207459-04

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9104.D\

Analysis Lot: 298582
 Instrument Name: R-MS-07
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: NA
Date Received: NA
Date Analyzed: 7/2/12 17:54

Sample Name: Method Blank
Lab Code: RQ1207459-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA7\DATA\070212\J9104.D\

Analysis Lot: 298582
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/2/12 17:54	
Dibromofluoromethane	102	89-119	7/2/12 17:54	
Toluene-d8	99	87-121	7/2/12 17:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: NA
Date Received: NA
Date Analyzed: 7/3/12 18:53

Sample Name: Method Blank
Lab Code: RQ1207523-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\MSVOA7\DATA\070312\J9143.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.23	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.20	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.20	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.20	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.28	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	11	
78-93-3	2-Butanone (MEK)	10	U	10	0.51	
591-78-6	2-Hexanone	10	U	10	0.35	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.27	
67-64-1	Acetone	10	U	10	0.98	
71-43-2	Benzene	5.0	U	5.0	0.21	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.20	
75-25-2	Bromoform	5.0	U	5.0	0.27	
74-83-9	Bromomethane	5.0	U	5.0	0.31	
75-15-0	Carbon Disulfide	10	U	10	0.20	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.27	
108-90-7	Chlorobenzene	5.0	U	5.0	0.20	
75-00-3	Chloroethane	5.0	U	5.0	0.31	
67-66-3	Chloroform	5.0	U	5.0	0.22	
74-87-3	Chloromethane	5.0	U	5.0	0.24	
110-82-7	Cyclohexane	10	U	10	0.24	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.20	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	
75-09-2	Dichloromethane	5.0	U	5.0	0.22	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: NA
Date Received: NA
Date Analyzed: 7/3/12 18:53

Sample Name: Method Blank
Lab Code: RQ1207523-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA7\DATA\070312\J9143.D\

Analysis Lot: 298776
Instrument Name: R-MS-07
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.23	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.20	
108-87-2	Methylcyclohexane	10	U	10	0.25	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.20	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.23	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.23	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.20	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.20	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.21	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.20	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	7/3/12 18:53	
Dibromofluoromethane	103	89-119	7/3/12 18:53	
Toluene-d8	97	87-121	7/3/12 18:53	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Collected: NA
Date Received: NA
Date Analyzed: 7/3/12 09:36

Sample Name: Method Blank
Lab Code: RQ1207475-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star319.run

Analysis Lot: 298647
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	2.0	U	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Analyzed: 7/3/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample					
R1204170-LCS1					
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	9060A	10.5	10.0	105	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170

Date Analyzed: 7/4/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L

Basis: NA

Lab Control Sample
R1204170-LCS2

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	9060A	10.4	10.0	104	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Analyzed: 7/10/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R1204170-LCS3

Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	9060A	10.3	10.0	103	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170

Date Analyzed: 7/2/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 298582

Lab Control Sample

RQ1207459-03

Analyte Name	Result	Spike		% Rec Limits
		Amount	% Rec	
1,1,1-Trichloroethane (TCA)	19.3	20.0	97	72 - 128
1,1,2,2-Tetrachloroethane	18.7	20.0	94	72 - 131
1,1,2-Trichloroethane	19.4	20.0	97	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	19.1	20.0	96	68 - 136
1,1-Dichloroethane (1,1-DCA)	22.0	20.0	110	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.9	20.0	105	72 - 129
1,2,4-Trichlorobenzene	17.3	20.0	87	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.1	20.0	81	62 - 131
1,2-Dibromoethane	18.4	20.0	92	78 - 125
1,2-Dichlorobenzene	18.0	20.0	90	79 - 124
1,2-Dichloroethane	21.3	20.0	107	73 - 127
1,2-Dichloropropane	21.0	20.0	105	80 - 123
1,3-Dichlorobenzene	18.3	20.0	92	78 - 124
1,4-Dichlorobenzene	18.8	20.0	94	78 - 123
n-Butanol	971	1010	97	70 - 130
2-Butanone (MEK)	19.6	20.0	98	60 - 133
2-Hexanone	18.5	20.0	92	61 - 131
4-Methyl-2-pentanone	18.4	20.0	92	61 - 132
Acetone	20.4	20.0	102	54 - 139
Benzene	19.4	20.0	97	78 - 121
Bromodichloromethane	20.2	20.0	101	80 - 125
Bromoform	18.0	20.0	90	68 - 130
Bromomethane	18.7	20.0	93	57 - 144
Carbon Disulfide	22.9	20.0	115	52 - 140
Carbon Tetrachloride	18.9	20.0	95	68 - 133
Chlorobenzene	19.0	20.0	95	80 - 121
Chloroethane	20.6	20.0	103	71 - 130
Chloroform	21.1	20.0	106	78 - 125
Chloromethane	21.4	20.0	107	61 - 138
Cyclohexane	20.3	20.0	101	57 - 126
Dibromochloromethane	19.3	20.0	96	78 - 133
Dichlorodifluoromethane (CFC 12)	20.3	20.0	101	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Analyzed: 7/2/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 298582

Lab Control Sample
RQ1207459-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	20.2	20.0	101	75 - 125
Ethylbenzene	18.3	20.0	92	78 - 123
Isopropylbenzene (Cumene)	18.1	20.0	90	73 - 133
Methyl Acetate	17.5	20.0	88	57 - 157
Methyl tert-Butyl Ether	19.9	20.0	100	75 - 126
Methylcyclohexane	21.8	20.0	109	61 - 125
Styrene	18.7	20.0	93	80 - 132
Tetrachloroethene (PCE)	18.2	20.0	91	72 - 131
Toluene	18.1	20.0	91	78 - 122
Trichloroethene (TCE)	19.4	20.0	97	74 - 127
Trichlorofluoromethane (CFC 11)	19.4	20.0	97	69 - 141
Vinyl Chloride	20.4	20.0	102	72 - 138
cis-1,2-Dichloroethene	20.7	20.0	103	78 - 122
cis-1,3-Dichloropropene	20.3	20.0	102	77 - 125
m,p-Xylenes	37.5	40.0	94	79 - 126
n-Butyl Acetate	18.7	20.0	93	31 - 144
o-Xylene	18.8	20.0	94	77 - 118
trans-1,2-Dichloroethene	20.5	20.0	102	75 - 121
trans-1,3-Dichloropropene	19.2	20.0	96	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170
Date Analyzed: 7/3/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 298776

Lab Control Sample
RQ1207523-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	21.4	20.0	107	72 - 128
1,1,2,2-Tetrachloroethane	19.6	20.0	98	72 - 131
1,1,2-Trichloroethane	19.5	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	21.0	20.0	105	68 - 136
1,1-Dichloroethane (1,1-DCA)	23.2	20.0	116	76 - 124
1,1-Dichloroethene (1,1-DCE)	23.3	20.0	117	72 - 129
1,2,4-Trichlorobenzene	18.2	20.0	91	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	17.2	20.0	86	62 - 131
1,2-Dibromoethane	19.3	20.0	96	78 - 125
1,2-Dichlorobenzene	19.1	20.0	96	79 - 124
1,2-Dichloroethane	22.7	20.0	113	73 - 127
1,2-Dichloropropane	21.1	20.0	106	80 - 123
1,3-Dichlorobenzene	19.8	20.0	99	78 - 124
1,4-Dichlorobenzene	20.0	20.0	100	78 - 123
n-Butanol	1120	1010	112	70 - 130
2-Butanone (MEK)	21.7	20.0	109	60 - 133
2-Hexanone	20.4	20.0	102	61 - 131
4-Methyl-2-pentanone	20.8	20.0	104	61 - 132
Acetone	21.2	20.0	106	54 - 139
Benzene	20.3	20.0	102	78 - 121
Bromodichloromethane	20.5	20.0	102	80 - 125
Bromoform	18.9	20.0	94	68 - 130
Bromomethane	20.4	20.0	102	57 - 144
Carbon Disulfide	24.7	20.0	124	52 - 140
Carbon Tetrachloride	21.2	20.0	106	68 - 133
Chlorobenzene	20.1	20.0	100	80 - 121
Chloroethane	22.2	20.0	111	71 - 130
Chloroform	22.4	20.0	112	78 - 125
Chloromethane	21.7	20.0	108	61 - 138
Cyclohexane	21.2	20.0	106	57 - 126
Dibromochloromethane	19.5	20.0	97	78 - 133
Dichlorodifluoromethane (CFC 12)	21.7	20.0	108	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170

Date Analyzed: 7/3/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 298776

Lab Control Sample
RQ1207523-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	22.1	20.0	111	75 - 125
Ethylbenzene	19.9	20.0	99	78 - 123
Isopropylbenzene (Cumene)	19.9	20.0	100	73 - 133
Methyl Acetate	19.8	20.0	99	57 - 157
Methyl tert-Butyl Ether	21.3	20.0	107	75 - 126
Methylcyclohexane	21.5	20.0	108	61 - 125
Styrene	19.9	20.0	99	80 - 132
Tetrachloroethene (PCE)	20.1	20.0	101	72 - 131
Toluene	19.3	20.0	97	78 - 122
Trichloroethene (TCE)	20.2	20.0	101	74 - 127
Trichlorofluoromethane (CFC 11)	21.7	20.0	108	69 - 141
Vinyl Chloride	22.7	20.0	113	72 - 138
cis-1,2-Dichloroethene	21.8	20.0	109	78 - 122
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	40.1	40.0	100	79 - 126
n-Butyl Acetate	19.8	20.0	99	31 - 144
o-Xylene	20.2	20.0	101	77 - 118
trans-1,2-Dichloroethene	22.1	20.0	111	75 - 121
trans-1,3-Dichloropropene	19.6	20.0	98	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 6/27/12
Sample Matrix: Water

Service Request: R1204170

Date Analyzed: 7/3/12

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 298647

Analyte Name	Lab Control Sample RQ1207475-02			Duplicate Lab Control Sample RQ1207475-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	31.3	26.0	120	31.7	26.0	122	56 - 148	1	20
Ethene	28.4	24.3	117	28.9	24.3	119	58 - 155	2	20
Methane	31.6	26.2	121	32.4	26.2	123	55 - 150	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Damraio Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: [Signature]

Sample ID	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) Plus n-butyl acetate	TOC (9060A)	MEEs (RSK 175)	REMARKS
LC34-BW0003A-024.5-20120627	6/27/2012	455	001	W	9	3	3	3	
LC34-BW0003B-031.5-20120627	6/27/2012	1022	002	W	9	3	3	3	
LC34-BW0003C-038.5-20120627	6/27/2012	1056	003	W	9	3	3	3	
LC34-BW0003D-045.5-20120627	6/27/2012	1135	004	W	9	3	3	3	
LC34-BW0003E-052.5-20120627	6/27/2012	1250	005	W	9	3	3	3	
LC34-BW0003F-059.5-20120627	6/27/2012	1323	006	W	9	3	3	3	
LC34-BW0003G-066.5-20120627	6/27/2012	1410	007	W	9	3	3	3	
LC34-BW0003H-073.5-20120627	6/27/2012	1410	007	W	3	3			

Analysis Requested

TURNAROUND REQUIREMENTS
 24 hr ___ 48 hr ___ 5 BD ___
 X ___ Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X ___ EDD? ___ NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Fred Damraio
 Firm: Geosyntec Consultants
 Date/Time: 10/27/12 1030

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Amy Kentschke
 Firm: ACS
 Date/Time: 10/29/12 0925

Comments/Special Instructions:
R1204170 5
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B 6/27/12




Cooler Receipt and Preservation Check Form

Project/Client GeoSyntec Folder Number R1204170

Cooler received on 6/29/12 by: AKH COURIER: ALS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? ALS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 10.7°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 6/29/12 0935

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location R-002 by AKH on 6/29/12 at 0940
 5035 samples placed in storage location _____ by _____ on _____ at _____
 PC Secondary Review: 6/29/12 KB client notified on sample confirm

Cooler Breakdown: Date: 6/29/12 Time: 1200 by: AKH

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	Lot Received		Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO					
≥12	NaOH							
≤2	HNO ₃							
≤2	H ₂ SO ₄			<u>WC 112015C</u>	<u>6/13</u>			
<4	NaHSO ₄							
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)				
	Na ₂ S ₂ O ₃	-	-					
	Zn Aceta	-	-					
	HCl	*	*	<u>4111060</u>	<u>5/13</u>			

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet

Bottle lot numbers: 2-059-001, 2-059-003

Other Comments: 1 vial for B100003F, 1 DW-188680 w/ bubbles

PC Secondary Review: KB 7/17/12

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter

Certificate of Analysis: Gene-Trac® *Dehalococcoides* Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2548

Project: LC34

Report Date: 12-Jul-12

Customer Reference: FO0522B

Data Files: iQ5-GBA-QPCR-0019
MyiQ-DHC-QPCR-0914
MyiQ-DB-DHC-QPCR-0297

Table 1a: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc *	<i>Dehalococcoides</i> Enumeration/Liter **
LC34-BW0001C-038.5-20120626	DHC-8353	26-Jun-12	Groundwater	15 - 38 %	1 x 10 ⁸
LC34-BW0001E-052.5-20120626	DHC-8354	26-Jun-12	Groundwater	3 - 7 %	2 x 10 ⁷
LC34-RW0007-038.5-20120626	DHC-8355	26-Jun-12	Groundwater	4 - 11 %	2 x 10 ⁷
LC34-RW0008-052.0-20120626	DHC-8356	26-Jun-12	Groundwater	11 - 28 %	9 x 10 ⁷
LC34-BW0003C-038.5-20120627	DHC-8357	27-Jun-12	Groundwater	25 - 58 %	2 x 10 ⁸
LC34-BW0003E-052.5-20120627	DHC-8358	27-Jun-12	Groundwater	0.6 - 2 %	3 x 10 ⁶

Notes:

* Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample. Range represents normal variation in Dhc enumeration.

** Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.


J The associated value is an estimated quantity between the method detection limit and quantitation limit.

U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *Dehalococcoides* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Approved: 
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Certificate of Analysis: Gene-Trac® VC, Vinyl Chloride Reductase (vcrA) Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2548

Project: LC34

Report Date: 12-Jul-12

Customer Reference: FO0522B

Data Files: MyiQ-VC-QPCR-0488
MyiQ-DB-VC-QPCR-0224
VC-QPCR-check-gel-0508

Table 1b: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent <i>vcrA</i> *	<i>Dehalococcoides</i> Enumeration/Liter **
LC34-BW0001C-038.5-20120626	VCR-3282	26-Jun-12	Groundwater	16 - 41 %	1 x 10 ⁸
LC34-BW0001E-052.5-20120626	VCR-3283	26-Jun-12	Groundwater	4 - 10 %	2 x 10 ⁷
LC34-RW0007-038.5-20120626	VCR-3284	26-Jun-12	Groundwater	3 - 8 %	2 x 10 ⁷
LC34-RW0008-052.0-20120626	VCR-3285	26-Jun-12	Groundwater	12 - 31 %	1 x 10 ⁸
LC34-BW0003C-038.5-20120627	VCR-3286	27-Jun-12	Groundwater	13 - 34 %	9 x 10 ⁷
LC34-BW0003E-052.5-20120627	VCR-3287	27-Jun-12	Groundwater	1 - 4 %	8 x 10 ⁶

Notes:

* Percentage of bacteria in the microbial population that harbor the *vcrA* gene. This value is calculated by dividing the measured number of cells harboring the vinyl chloride reductase A (*vcrA*) gene by the total number of bacteria in the sample estimated using the mass of DNA extracted from the sample. Range represents normal variation in enumeration of *vcrA*.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *vcrA* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

C Correction factor applied to correct for non-specific PCR amplification products.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Approved: 
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Table 2: Detailed Test Parameters, Gene-Trac Test Reference S-2548

Customer Sample ID	LC34-BW0001C-038.5-20120626	LC34-BW0001E-052.5-20120626	LC34-RW0007-038.5-20120626	LC34-RW0008-052.0-20120626	LC34-BW0003C-038.5-20120627	LC34-BW0003E-052.5-20120627
SiREM Dhc Sample ID	DHC-8353	DHC-8354	DHC-8355	DHC-8356	DHC-8357	DHC-8358
SiREM <i>vcrA</i> Sample ID	VCR-3282	VCR-3283	VCR-3284	VCR-3285	VCR-3286	VCR-3287
Date Received	29-Jun-12	29-Jun-12	29-Jun-12	29-Jun-12	29-Jun-12	29-Jun-12
Sample Temperature	8 °C	8 °C	8 °C	8 °C	8 °C	8 °C
Filtration Date	3-Jul-12	3-Jul-12	3-Jul-12	3-Jul-12	3-Jul-12	3-Jul-12
Volume Used for DNA Extraction	500 mL	500 mL	500 mL	500 mL	500 mL	500 mL
DNA Extraction Date	4-Jul-12	4-Jul-12	4-Jul-12	4-Jul-12	4-Jul-12	4-Jul-12
DNA Concentration in Sample (extractable)	1406 ng/L	1248 ng/L	1247 ng/L	1637 ng/L	1206 ng/L	1082 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected	Detected	Detected	Detected
Dhc qPCR Date Analyzed	6-Jul-12	6-Jul-12	6-Jul-12	6-Jul-12	6-Jul-12	6-Jul-12
<i>vcrA</i> qPCR Date Analyzed	9-Jul-12	9-Jul-12	9-Jul-12	9-Jul-12	9-Jul-12	9-Jul-12
Laboratory Controls (see Tables 3 & 4)	Passed	Passed	Passed	Passed	Passed	Passed
Comments	--	--	--	--	--	--

Notes:

Refer to Tables 3 & 4 for detailed results of controls.

°C = degrees Celsius

vcrA = vinyl chloride reductase

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = Dehalococcoides

ng/L = nanograms per liter

mL = milliliters

DNA = Deoxyribonucleic acid

Table 3: Experimental Control Results, Gene-Trac Test Reference S-2548

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Liter	Recovered Dhc 16S rRNA Gene Copies per Liter	Comments
Positive Control Low Concentration	6-Jul-12	qPCR with KB1 genomic DNA (CSLD-0551)	1.4×10^5	1.4×10^5	
Positive Control High Concentration	6-Jul-12	qPCR with KB1 genomic DNA (CSDH-0551)	1.8×10^7	1.7×10^7	
Filter Blank	6-Jul-12	DNA Extraction Sterile Water (FB-1713)	0	2.6×10^3 U	
Negative Control	6-Jul-12	Tris Reagent Blank (TBD-0511)	0	2.6×10^3 U	

Notes:

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.

Table 4: Experimental Control Results, Gene-Trac Test Reference S-2548

Laboratory Control	Analysis Date	Control Description	Spiked <i>vcrA</i> reductase Gene Copies per Liter	Recovered <i>vcrA</i> reductase Gene Copies per Liter	Comments
Positive Control Low Concentration	9-Jul-12	qPCR with KB1 genomic DNA (CSLV-0356)	3.2×10^5	3.3×10^5	
Positive Control High Concentration	9-Jul-12	qPCR with KB1 genomic DNA (CSHV-0356)	3.6×10^7	5.0×10^7	
Filter Blank	9-Jul-12	DNA Extraction Sterile Water (FB-1713)	0	2.6×10^3 U	
Negative Control	9-Jul-12	Tris Reagent Blank (TBV-0327)	0	2.6×10^3 U	

Notes:

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.

vcrA = vinyl chloride reductase



August 03, 2012

Service Request No: R1204678

Dr. Rebecca Daprato
GeoSyntec Consultants
2692 Madison Rd
Suite N1 #223
Cincinnati, OH 45208

Laboratory Results for: ESTCP PED C34 FO0552B 7/19/12

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on July 20, 2012. For your reference, these analyses have been assigned our service request number **R1204678**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

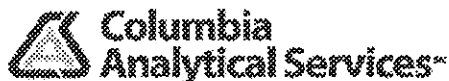
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 19



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Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company



PROXY SOLUTIONS PROXY MANAGEMENT

00001

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (7/19/12)
Sample Matrix: Water

Service Request No.: R1204678
Date Received: 7/20/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 7/19/12 and were received for analysis at Columbia Analytical Services on 7/20/12 via a national courier. The samples were received at a cooler temperature of 3.3°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received. One (1) vial for each of the samples contained headspace as noted on the Cooler Receipt and Preservation form. Two (2) vials for each of the samples were acceptable.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C.

The initial calibration criteria was met for these samples. The Continuing Calibration Verification (CCV) %D for 1,2-Dichloroethane was outside the 20% limit on the 7/24/12 run. Any hits for this compound on the associated run should be considered as estimated, however the samples were non-detect for this compound and therefore unaffected.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits.

The samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date

8/31/12

00002

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1204678

Lab ID
R1204678-001
R1204678-002

Client ID
LC34-RW0007-038.5-20120719
LC34-RW0008-052.0-20120719

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120719
Lab Code: R1204678-001

Service Request: R1204678
Date Collected: 7/19/12 1024
Date Received: 7/20/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	500	U	500	23	100	NA	7/24/12 00:34		301385	
1,1,2,2-Tetrachloroethane	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,1,2-Trichloroethane	500	U	500	23	100	NA	7/24/12 00:34		301385	
1,1,2-Trichloro-1,2,2-trifluoroethane	8900		500	31	100	NA	7/24/12 00:34		301385	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,1-Dichloroethene (1,1-DCE)	500	U	500	29	100	NA	7/24/12 00:34		301385	
1,2,4-Trichlorobenzene	500	U	500	26	100	NA	7/24/12 00:34		301385	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	38	100	NA	7/24/12 00:34		301385	
1,2-Dibromoethane	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,2-Dichlorobenzene	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,2-Dichloroethane	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,2-Dichloropropane	500	U	500	29	100	NA	7/24/12 00:34		301385	
1,3-Dichlorobenzene	500	U	500	20	100	NA	7/24/12 00:34		301385	
1,4-Dichlorobenzene	500	U	500	20	100	NA	7/24/12 00:34		301385	
n-Butanol	25000	U	25000	1100	100	NA	7/24/12 00:34		301385	
2-Butanone (MEK)	1000	U	1000	51	100	NA	7/24/12 00:34		301385	
2-Hexanone	1000	U	1000	35	100	NA	7/24/12 00:34		301385	
4-Methyl-2-pentanone	1000	U	1000	27	100	NA	7/24/12 00:34		301385	
Acetone	180	I	1000	98	100	NA	7/24/12 00:34		301385	
Benzene	500	U	500	21	100	NA	7/24/12 00:34		301385	
Bromodichloromethane	500	U	500	20	100	NA	7/24/12 00:34		301385	
Bromoform	500	U	500	27	100	NA	7/24/12 00:34		301385	
Bromomethane	500	U	500	31	100	NA	7/24/12 00:34		301385	
Carbon Disulfide	1000	U	1000	20	100	NA	7/24/12 00:34		301385	
Carbon Tetrachloride	500	U	500	27	100	NA	7/24/12 00:34		301385	
Chlorobenzene	500	U	500	20	100	NA	7/24/12 00:34		301385	
Chloroethane	500	U	500	31	100	NA	7/24/12 00:34		301385	
Chloroform	500	U	500	22	100	NA	7/24/12 00:34		301385	
Chloromethane	500	U	500	24	100	NA	7/24/12 00:34		301385	
Cyclohexane	1000	U	1000	24	100	NA	7/24/12 00:34		301385	
Dibromochloromethane	500	U	500	20	100	NA	7/24/12 00:34		301385	
Dichlorodifluoromethane (CFC 12)	500	U	500	57	100	NA	7/24/12 00:34		301385	
Dichloromethane	500	U	500	22	100	NA	7/24/12 00:34		301385	
Ethylbenzene	500	U	500	20	100	NA	7/24/12 00:34		301385	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	7/24/12 00:34		301385	
Methyl Acetate	1000	U	1000	23	100	NA	7/24/12 00:34		301385	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120719
Lab Code: R1204678-001

Service Request: R1204678
Date Collected: 7/19/12 1024
Date Received: 7/20/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	500	U	500	20	100	NA	7/24/12 00:34		301385	
Methylcyclohexane	1000	U	1000	25	100	NA	7/24/12 00:34		301385	
Styrene	500	U	500	20	100	NA	7/24/12 00:34		301385	
Tetrachloroethene (PCE)	500	U	500	20	100	NA	7/24/12 00:34		301385	
Toluene	500	U	500	20	100	NA	7/24/12 00:34		301385	
Trichloroethene (TCE)	640		500	23	100	NA	7/24/12 00:34		301385	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	7/24/12 00:34		301385	
Vinyl Chloride	7900		500	23	100	NA	7/24/12 00:34		301385	
cis-1,2-Dichloroethene	4600		500	20	100	NA	7/24/12 00:34		301385	
cis-1,3-Dichloropropene	500	U	500	20	100	NA	7/24/12 00:34		301385	
m,p-Xylenes	500	U	500	20	100	NA	7/24/12 00:34		301385	
n-Butyl Acetate	500	U	500	21	100	NA	7/24/12 00:34		301385	
o-Xylene	500	U	500	20	100	NA	7/24/12 00:34		301385	
trans-1,2-Dichloroethene	260	I	500	20	100	NA	7/24/12 00:34		301385	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	7/24/12 00:34		301385	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/24/12 00:34	
Dibromofluoromethane	103	89-119	7/24/12 00:34	
Toluene-d8	101	87-121	7/24/12 00:34	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120719
Lab Code: R1204678-002

Service Request: R1204678
Date Collected: 7/19/12 1106
Date Received: 7/20/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.2	5	NA	7/24/12 19:08		301592	
1,1,2,2-Tetrachloroethane	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,1,2-Trichloroethane	25	U	25	1.2	5	NA	7/24/12 19:08		301592	
1,1,2-Trichloro-1,2,2-trifluoroethane	840		25	1.6	5	NA	7/24/12 19:08		301592	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,1-Dichloroethene (1,1-DCE)	2.7	I	25	1.5	5	NA	7/24/12 19:08		301592	
1,2,4-Trichlorobenzene	25	U	25	1.3	5	NA	7/24/12 19:08		301592	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	1.9	5	NA	7/24/12 19:08		301592	
1,2-Dibromoethane	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,2-Dichlorobenzene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,2-Dichloroethane	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,2-Dichloropropane	25	U	25	1.5	5	NA	7/24/12 19:08		301592	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
n-Butanol	1300	U	1300	53	5	NA	7/24/12 19:08		301592	
2-Butanone (MEK)	50	U	50	2.6	5	NA	7/24/12 19:08		301592	
2-Hexanone	50	U	50	1.8	5	NA	7/24/12 19:08		301592	
4-Methyl-2-pentanone	50	U	50	1.4	5	NA	7/24/12 19:08		301592	
Acetone	26	I	50	4.9	5	NA	7/24/12 19:08		301592	
Benzene	25	U	25	1.1	5	NA	7/24/12 19:08		301592	
Bromodichloromethane	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Bromoform	25	U	25	1.4	5	NA	7/24/12 19:08		301592	
Bromomethane	25	U	25	1.6	5	NA	7/24/12 19:08		301592	
Carbon Disulfide	3.2	I	50	1.0	5	NA	7/24/12 19:08		301592	
Carbon Tetrachloride	25	U	25	1.4	5	NA	7/24/12 19:08		301592	
Chlorobenzene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Chloroethane	25	U	25	1.6	5	NA	7/24/12 19:08		301592	
Chloroform	25	U	25	1.1	5	NA	7/24/12 19:08		301592	
Chloromethane	25	U	25	1.2	5	NA	7/24/12 19:08		301592	
Cyclohexane	50	U	50	1.2	5	NA	7/24/12 19:08		301592	
Dibromochloromethane	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.9	5	NA	7/24/12 19:08		301592	
Dichloromethane	25	U	25	1.1	5	NA	7/24/12 19:08		301592	
Ethylbenzene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Methyl Acetate	50	U	50	1.2	5	NA	7/24/12 19:08		301592	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120719
Lab Code: R1204678-002

Service Request: R1204678
Date Collected: 7/19/12 1106
Date Received: 7/20/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Methylcyclohexane	50	U	50	1.3	5	NA	7/24/12 19:08		301592	
Styrene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Tetrachloroethene (PCE)	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Toluene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Trichloroethene (TCE)	450		25	1.2	5	NA	7/24/12 19:08		301592	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
Vinyl Chloride	870		25	1.2	5	NA	7/24/12 19:08		301592	
cis-1,2-Dichloroethene	640		25	1.0	5	NA	7/24/12 19:08		301592	
cis-1,3-Dichloropropene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
m,p-Xylenes	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
n-Butyl Acetate	25	U	25	1.1	5	NA	7/24/12 19:08		301592	
o-Xylene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	
trans-1,2-Dichloroethene	23	I	25	1.0	5	NA	7/24/12 19:08		301592	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	7/24/12 19:08		301592	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	7/24/12 19:08	
Dibromofluoromethane	104	89-119	7/24/12 19:08	
Toluene-d8	100	87-121	7/24/12 19:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1208295-04

Service Request: R1204678
Date Collected: NA
Date Received: NA

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.23	1	NA	7/23/12 16:54		301385	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,1,2-Trichloroethane	5.0	U	5.0	0.23	1	NA	7/23/12 16:54		301385	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	1	NA	7/23/12 16:54		301385	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.29	1	NA	7/23/12 16:54		301385	
1,2,4-Trichlorobenzene	5.0	U	5.0	0.26	1	NA	7/23/12 16:54		301385	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.38	1	NA	7/23/12 16:54		301385	
1,2-Dibromoethane	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,2-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,2-Dichloroethane	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,2-Dichloropropane	5.0	U	5.0	0.28	1	NA	7/23/12 16:54		301385	
1,3-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
1,4-Dichlorobenzene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
n-Butanol	250	U	250	11	1	NA	7/23/12 16:54		301385	
2-Butanone (MEK)	10	U	10	0.51	1	NA	7/23/12 16:54		301385	
2-Hexanone	10	U	10	0.35	1	NA	7/23/12 16:54		301385	
4-Methyl-2-pentanone	10	U	10	0.27	1	NA	7/23/12 16:54		301385	
Acetone	10	U	10	0.98	1	NA	7/23/12 16:54		301385	
Benzene	5.0	U	5.0	0.21	1	NA	7/23/12 16:54		301385	
Bromodichloromethane	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Bromoform	5.0	U	5.0	0.27	1	NA	7/23/12 16:54		301385	
Bromomethane	5.0	U	5.0	0.31	1	NA	7/23/12 16:54		301385	
Carbon Disulfide	10	U	10	0.20	1	NA	7/23/12 16:54		301385	
Carbon Tetrachloride	5.0	U	5.0	0.27	1	NA	7/23/12 16:54		301385	
Chlorobenzene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Chloroethane	5.0	U	5.0	0.31	1	NA	7/23/12 16:54		301385	
Chloroform	5.0	U	5.0	0.22	1	NA	7/23/12 16:54		301385	
Chloromethane	5.0	U	5.0	0.24	1	NA	7/23/12 16:54		301385	
Cyclohexane	10	U	10	0.24	1	NA	7/23/12 16:54		301385	
Dibromochloromethane	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.56	1	NA	7/23/12 16:54		301385	
Dichloromethane	5.0	U	5.0	0.22	1	NA	7/23/12 16:54		301385	
Ethylbenzene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Methyl Acetate	10	U	10	0.23	1	NA	7/23/12 16:54		301385	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1208295-04

Service Request: R1204678
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Methylcyclohexane	10	U	10	0.25	1	NA	7/23/12 16:54		301385	
Styrene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Toluene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/23/12 16:54		301385	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/23/12 16:54		301385	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/23/12 16:54		301385	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/23/12 16:54		301385	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	7/23/12 16:54	
Dibromofluoromethane	100	89-119	7/23/12 16:54	
Toluene-d8	98	87-121	7/23/12 16:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1208382-04

Service Request: R1204678
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.23	1	NA	7/24/12 16:41		301592	
1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,1,2-Trichloroethane	5.0 U	5.0	0.23	1	NA	7/24/12 16:41		301592	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	1	NA	7/24/12 16:41		301592	
1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.29	1	NA	7/24/12 16:41		301592	
1,2,4-Trichlorobenzene	5.0 U	5.0	0.26	1	NA	7/24/12 16:41		301592	
1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.38	1	NA	7/24/12 16:41		301592	
1,2-Dibromoethane	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,2-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,2-Dichloroethane	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,2-Dichloropropane	5.0 U	5.0	0.28	1	NA	7/24/12 16:41		301592	
1,3-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
1,4-Dichlorobenzene	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
n-Butanol	250 U	250	11	1	NA	7/24/12 16:41		301592	
2-Butanone (MEK)	10 U	10	0.51	1	NA	7/24/12 16:41		301592	
2-Hexanone	10 U	10	0.35	1	NA	7/24/12 16:41		301592	
4-Methyl-2-pentanone	10 U	10	0.27	1	NA	7/24/12 16:41		301592	
Acetone	10 U	10	0.98	1	NA	7/24/12 16:41		301592	
Benzene	5.0 U	5.0	0.21	1	NA	7/24/12 16:41		301592	
Bromodichloromethane	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Bromoform	5.0 U	5.0	0.27	1	NA	7/24/12 16:41		301592	
Bromomethane	5.0 U	5.0	0.31	1	NA	7/24/12 16:41		301592	
Carbon Disulfide	10 U	10	0.20	1	NA	7/24/12 16:41		301592	
Carbon Tetrachloride	5.0 U	5.0	0.27	1	NA	7/24/12 16:41		301592	
Chlorobenzene	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Chloroethane	5.0 U	5.0	0.31	1	NA	7/24/12 16:41		301592	
Chloroform	5.0 U	5.0	0.22	1	NA	7/24/12 16:41		301592	
Chloromethane	5.0 U	5.0	0.24	1	NA	7/24/12 16:41		301592	
Cyclohexane	10 U	10	0.24	1	NA	7/24/12 16:41		301592	
Dibromochloromethane	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.56	1	NA	7/24/12 16:41		301592	
Dichloromethane	5.0 U	5.0	0.22	1	NA	7/24/12 16:41		301592	
Ethylbenzene	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Methyl Acetate	10 U	10	0.23	1	NA	7/24/12 16:41		301592	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: RQ1208382-04

Service Request: R1204678
Date Collected: NA
Date Received: NA
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Methylcyclohexane	10	U	10	0.25	1	NA	7/24/12 16:41		301592	
Styrene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Toluene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Trichloroethene (TCE)	5.0	U	5.0	0.23	1	NA	7/24/12 16:41		301592	
Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
Vinyl Chloride	5.0	U	5.0	0.23	1	NA	7/24/12 16:41		301592	
cis-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
cis-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
m,p-Xylenes	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
n-Butyl Acetate	5.0	U	5.0	0.21	1	NA	7/24/12 16:41		301592	
o-Xylene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
trans-1,2-Dichloroethene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	
trans-1,3-Dichloropropene	5.0	U	5.0	0.20	1	NA	7/24/12 16:41		301592	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	7/24/12 16:41	
Dibromofluoromethane	102	89-119	7/24/12 16:41	
Toluene-d8	100	87-121	7/24/12 16:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water

Service Request: R1204678
Date Analyzed: 7/23/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 301385

Lab Control Sample
RQ1208295-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.6	20.0	103	72 - 128
1,1,2,2-Tetrachloroethane	20.3	20.0	101	72 - 131
1,1,2-Trichloroethane	19.0	20.0	95	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	20.3	20.0	101	68 - 136
1,1-Dichloroethane (1,1-DCA)	21.7	20.0	108	76 - 124
1,1-Dichloroethene (1,1-DCE)	21.9	20.0	109	72 - 129
1,2,4-Trichlorobenzene	17.9	20.0	90	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	18.7	20.0	93	62 - 131
1,2-Dibromoethane	18.1	20.0	91	78 - 125
1,2-Dichlorobenzene	17.6	20.0	88	79 - 124
1,2-Dichloroethane	20.8	20.0	104	73 - 127
1,2-Dichloropropane	19.1	20.0	95	80 - 123
1,3-Dichlorobenzene	18.5	20.0	92	78 - 124
1,4-Dichlorobenzene	17.9	20.0	90	78 - 123
n-Butanol	1210	1010	121	70 - 130
2-Butanone (MEK)	21.8	20.0	109	60 - 133
2-Hexanone	21.4	20.0	107	61 - 131
4-Methyl-2-pentanone	20.8	20.0	104	61 - 132
Acetone	23.5	20.0	117	54 - 139
Benzene	18.1	20.0	91	78 - 121
Bromodichloromethane	18.8	20.0	94	80 - 125
Bromoform	18.2	20.0	91	68 - 130
Bromomethane	16.7	20.0	84	57 - 144
Carbon Disulfide	21.8	20.0	109	52 - 140
Carbon Tetrachloride	20.9	20.0	105	68 - 133
Chlorobenzene	18.5	20.0	92	80 - 121
Chloroethane	18.9	20.0	95	71 - 130
Chloroform	20.8	20.0	104	78 - 125
Chloromethane	19.4	20.0	97	61 - 138
Cyclohexane	19.5	20.0	98	57 - 126
Dibromochloromethane	18.7	20.0	94	78 - 133
Dichlorodifluoromethane (CFC 12)	17.3	20.0	86	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water

Service Request: R1204678
Date Analyzed: 7/23/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 301385

Lab Control Sample
RQ1208295-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.5	20.0	97	75 - 125
Ethylbenzene	18.5	20.0	92	78 - 123
Isopropylbenzene (Cumene)	18.9	20.0	95	73 - 133
Methyl Acetate	21.7	20.0	109	57 - 157
Methyl tert-Butyl Ether	19.9	20.0	100	75 - 126
Methylcyclohexane	20.1	20.0	100	61 - 125
Styrene	18.0	20.0	90	80 - 132
Tetrachloroethene (PCE)	18.1	20.0	90	72 - 131
Toluene	18.0	20.0	90	78 - 122
Trichloroethene (TCE)	18.8	20.0	94	74 - 127
Trichlorofluoromethane (CFC 11)	21.1	20.0	105	69 - 141
Vinyl Chloride	19.7	20.0	99	72 - 138
cis-1,2-Dichloroethene	19.5	20.0	97	78 - 122
cis-1,3-Dichloropropene	18.5	20.0	93	77 - 125
m,p-Xylenes	37.8	40.0	94	79 - 126
n-Butyl Acetate	21.2	20.0	106	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	19.5	20.0	98	75 - 121
trans-1,3-Dichloropropene	18.4	20.0	92	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water

Service Request: R1204678
Date Analyzed: 7/24/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 301592

Lab Control Sample
RQ1208382-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.1	20.0	86	72 - 128
1,1,2,2-Tetrachloroethane	18.6	20.0	93	72 - 131
1,1,2-Trichloroethane	20.0	20.0	100	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	15.5	20.0	77	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.2	20.0	101	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.2	20.0	91	72 - 129
1,2,4-Trichlorobenzene	15.9	20.0	80	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	16.8	20.0	84	62 - 131
1,2-Dibromoethane	18.7	20.0	94	78 - 125
1,2-Dichlorobenzene	16.5	20.0	83	79 - 124
1,2-Dichloroethane	21.7	20.0	109	73 - 127
1,2-Dichloropropane	19.3	20.0	96	80 - 123
1,3-Dichlorobenzene	16.4	20.0	82	78 - 124
1,4-Dichlorobenzene	16.7	20.0	84	78 - 123
n-Butanol	1220	1010	121	70 - 130
2-Butanone (MEK)	21.4	20.0	107	60 - 133
2-Hexanone	21.8	20.0	109	61 - 131
4-Methyl-2-pentanone	21.2	20.0	106	61 - 132
Acetone	24.1	20.0	120	54 - 139
Benzene	16.8	20.0	84	78 - 121
Bromodichloromethane	19.6	20.0	98	80 - 125
Bromoform	17.4	20.0	87	68 - 130
Bromomethane	15.6	20.0	78	57 - 144
Carbon Disulfide	20.5	20.0	103	52 - 140
Carbon Tetrachloride	17.1	20.0	85	68 - 133
Chlorobenzene	17.2	20.0	86	80 - 121
Chloroethane	18.2	20.0	91	71 - 130
Chloroform	20.0	20.0	100	78 - 125
Chloromethane	17.4	20.0	87	61 - 138
Cyclohexane	18.5	20.0	93	57 - 126
Dibromochloromethane	18.1	20.0	90	78 - 133
Dichlorodifluoromethane (CFC 12)	12.4	20.0	62	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED C34 FO0552B 7/19/12
Sample Matrix: Water

Service Request: R1204678
Date Analyzed: 7/24/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C**Units:** µg/L**Basis:** NA**Analysis Lot:** 301592

Lab Control Sample
RQ1208382-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.3	20.0	97	75 - 125
Ethylbenzene	16.3	20.0	81	78 - 123
Isopropylbenzene (Cumene)	16.0	20.0	80	73 - 133
Methyl Acetate	22.3	20.0	111	57 - 157
Methyl tert-Butyl Ether	19.7	20.0	99	75 - 126
Methylcyclohexane	19.1	20.0	95	61 - 125
Styrene	17.1	20.0	85	80 - 132
Tetrachloroethene (PCE)	15.2	20.0	76	72 - 131
Toluene	16.4	20.0	82	78 - 122
Trichloroethene (TCE)	16.8	20.0	84	74 - 127
Trichlorofluoromethane (CFC 11)	15.9	20.0	79	69 - 141
Vinyl Chloride	16.3	20.0	82	72 - 138
cis-1,2-Dichloroethene	18.9	20.0	95	78 - 122
cis-1,3-Dichloropropene	18.0	20.0	90	77 - 125
m,p-Xylenes	33.4	40.0	83	79 - 126
n-Butyl Acetate	21.3	20.0	107	31 - 144
o-Xylene	17.5	20.0	87	77 - 118
trans-1,2-Dichloroethene	17.9	20.0	90	75 - 121
trans-1,3-Dichloropropene	18.3	20.0	92	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH 585-288-5380 FAX 585-288-8475

Analysis Requested

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Ste. 3 Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	REMARKS
LC34-RW0007-038.5-20120719	7/19/2012	1024	001	W	3	3	
LC34-RW0008-052.0-20120719	7/19/2012	1106	002	W	3	3	

Comments/Special Instructions:
REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

R1204678
 GeoSyntec Consultants
 ESTCP PED : C34 FO0552B 7/19/12


TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date:
 Invoice Information
 P.O. #
 Bill to: FO0552B

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: JOSEPH BARTEN
 Firm: GEOSYNTEC
 Date/Time: 7/19/12 - 1430

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Gregory O. Esmeretian
 Firm: ALS
 Date/Time: 7-20-12 9:30



Cooler Receipt and Preservation Check Form

Project/Client Geosyntec Folder Number R1204678

Cooler received on 7-20-12 by: ME COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc.)? YES NO
- Did all bottles arrive in good condition (unbroken)? YES NO
- Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
- Were Ice or Ice packs present? YES NO
- Where did the bottles originate? ALS/ROC, CLIENT
- Temperature of cooler(s) upon receipt: 3,3°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: 7-20-12 @ 9:38

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>R-002</u>	by	<u>ME</u>	on	<u>7-20-12</u>	at	<u>9:40</u>
5035 samples placed in storage location		by		on		at	

PC Secondary Review: KB 8/3/12

Cooler Breakdown: Date: 7/20/12 Time: 1216 by: Oh

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies:

pH	Reagent	YES NO		Lot Received ⁷⁻¹	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	-	-						

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust:

Bottle lot numbers: 8-059-001, 1-194-001

Other Comments:

* RW0007, and RW0008 each have one vial with significant headspace
ME 7-20-12

PC Secondary Review: KB 8/3/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm . WC .1 in. diameter



August 31, 2012

Service Request No: R1205418

Dr. Rebecca Daprato
GeoSyntec Consultants
11490 Westheimer
Suite 150
Houston, TX 77077

Laboratory Results for: ESTCP PED LC34 FO0552B 8/16/12

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on August 17, 2012. For your reference, these analyses have been assigned our service request number **R1205418**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

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Environmental

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RIGHT SOLUTIONS RIGHT PARTNER

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO0552B (8/16/12)
Sample Matrix: Water

Service Request No.: R1205418
Date Received: 8/17/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Two (2) water samples were collected by the client on 8/16/12 and were received for analysis at Columbia Analytical Services on 8/17/12 via a national courier. The samples were received at a cooler temperature of 4.5°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received.

Volatile Organic Compounds GC/MS

Two (2) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C.

The initial calibration criteria was met for these samples. The Continuing Calibration Verification (CCV) did not meet the minimum response factor for Trichloroethene on 8/21/12 and 8/22/12. All data is considered acceptable as the MRL has been verified by the low standard in the calibration.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits.

The samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks from 8/22/12 contained a low level hit of Bromomethane and Chloromethane and have been flagged with a "J". No data was affected.

No other analytical or QC problems were encountered.

Approved by  Date 8/31/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1205418

Lab ID
R1205418-001
R1205418-002

Client ID
LC34-RW0007-038.5-20120816
LC34-RW0008-052.0-20120816

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Collected: 8/16/12 1305
Date Received: 8/17/12
Date Analyzed: 8/22/12 12:35

Sample Name: LC34-RW0007-038.5-20120816
Lab Code: R1205418-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\082212\F8855.D\

Analysis Lot: 306125
Instrument Name: R-MS-08
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	13	
79-00-5	1,1,2-Trichloroethane	250	U	250	17	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	8700		250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	29	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	12	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	37	
106-93-4	1,2-Dibromoethane	250	U	250	12	
95-50-1	1,2-Dichlorobenzene	250	U	250	11	
107-06-2	1,2-Dichloroethane	250	U	250	18	
78-87-5	1,2-Dichloropropane	250	U	250	10	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	13000	U	13000	870	
78-93-3	2-Butanone (MEK)	500	U	500	41	
591-78-6	2-Hexanone	500	U	500	83	
108-10-1	4-Methyl-2-pentanone	500	U	500	34	
67-64-1	Acetone	500	U	500	62	
71-43-2	Benzene	250	U	250	10	
75-27-4	Bromodichloromethane	250	U	250	16	
75-25-2	Bromoform	250	U	250	21	
74-83-9	Bromomethane	250	U	250	15	
75-15-0	Carbon Disulfide	37	I	500	11	
56-23-5	Carbon Tetrachloride	250	U	250	23	
108-90-7	Chlorobenzene	250	U	250	15	
75-00-3	Chloroethane	250	U	250	12	
67-66-3	Chloroform	250	U	250	13	
74-87-3	Chloromethane	250	U	250	11	
110-82-7	Cyclohexane	500	U	500	13	
124-48-1	Dibromochloromethane	250	U	250	16	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	23	
75-09-2	Dichloromethane	250	U	250	16	
100-41-4	Ethylbenzene	250	U	250	10	
98-82-8	Isopropylbenzene (Cumene)	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Collected: 8/16/12 1305
Date Received: 8/17/12
Date Analyzed: 8/22/12 12:35

Sample Name: LC34-RW0007-038.5-20120816
Lab Code: R1205418-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\082212\F8855.D\

Analysis Lot: 306125
Instrument Name: R-MS-08
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	500	U	500	22	
1634-04-4	Methyl tert-Butyl Ether	250	U	250	15	
108-87-2	Methylcyclohexane	500	U	500	14	
100-42-5	Styrene	250	U	250	10	
127-18-4	Tetrachloroethene (PCE)	250	U	250	15	
108-88-3	Toluene	250	U	250	10	
79-01-6	Trichloroethene (TCE)	660		250	11	
75-69-4	Trichlorofluoromethane (CFC 11)	250	U	250	10	
75-01-4	Vinyl Chloride	7400		250	16	
156-59-2	cis-1,2-Dichloroethene	4300		250	15	
10061-01-5	cis-1,3-Dichloropropene	250	U	250	12	
179601-23-1	m,p-Xylenes	250	U	250	17	
123-86-4	n-Butyl Acetate	250	U	250	20	
95-47-6	o-Xylene	250	U	250	10	
156-60-5	trans-1,2-Dichloroethene	190	I	250	17	
10061-02-6	trans-1,3-Dichloropropene	250	U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	8/22/12 12:35	
Dibromofluoromethane	105	89-119	8/22/12 12:35	
Toluene-d8	105	87-121	8/22/12 12:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120816
Lab Code: R1205418-002

Service Request: R1205418
Date Collected: 8/16/12 1332
Date Received: 8/17/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.8	5	NA	8/21/12 15:57		305910	
1,1,2,2-Tetrachloroethane	25	U	25	1.3	5	NA	8/21/12 15:57		305910	
1,1,2-Trichloroethane	25	U	25	1.8	5	NA	8/21/12 15:57		305910	
1,1,2-Trichloro-1,2,2-trifluoroethane	1100		50	3.1	10	NA	8/22/12 13:03		306125	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
1,1-Dichloroethene (1,1-DCE)	25	U	25	2.9	5	NA	8/21/12 15:57		305910	
1,2,4-Trichlorobenzene	25	U	25	1.2	5	NA	8/21/12 15:57		305910	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	3.7	5	NA	8/21/12 15:57		305910	
1,2-Dibromoethane	25	U	25	1.2	5	NA	8/21/12 15:57		305910	
1,2-Dichlorobenzene	25	U	25	1.1	5	NA	8/21/12 15:57		305910	
1,2-Dichloroethane	25	U	25	1.8	5	NA	8/21/12 15:57		305910	
1,2-Dichloropropane	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
n-Butanol	1300	U	1300	87	5	NA	8/21/12 15:57		305910	
2-Butanone (MEK)	50	U	50	4.1	5	NA	8/21/12 15:57		305910	
2-Hexanone	50	U	50	8.3	5	NA	8/21/12 15:57		305910	
4-Methyl-2-pentanone	50	U	50	3.4	5	NA	8/21/12 15:57		305910	
Acetone	6.5	I	50	6.2	5	NA	8/21/12 15:57		305910	
Benzene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
Bromodichloromethane	25	U	25	1.6	5	NA	8/21/12 15:57		305910	
Bromoform	25	U	25	2.1	5	NA	8/21/12 15:57		305910	
Bromomethane	25	U	25	1.5	5	NA	8/21/12 15:57		305910	
Carbon Disulfide	6.7	I	50	1.1	5	NA	8/21/12 15:57		305910	
Carbon Tetrachloride	25	U	25	2.3	5	NA	8/21/12 15:57		305910	
Chlorobenzene	25	U	25	1.5	5	NA	8/21/12 15:57		305910	
Chloroethane	25	U	25	1.2	5	NA	8/21/12 15:57		305910	
Chloroform	25	U	25	1.3	5	NA	8/21/12 15:57		305910	
Chloromethane	25	U	25	1.1	5	NA	8/21/12 15:57		305910	
Cyclohexane	50	U	50	1.3	5	NA	8/21/12 15:57		305910	
Dibromochloromethane	25	U	25	1.6	5	NA	8/21/12 15:57		305910	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.4	5	NA	8/21/12 15:57		305910	
Dichloromethane	25	U	25	1.6	5	NA	8/21/12 15:57		305910	
Ethylbenzene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
Methyl Acetate	50	U	50	2.2	5	NA	8/21/12 15:57		305910	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120816
Lab Code: R1205418-002

Service Request: R1205418
Date Collected: 8/16/12 1332
Date Received: 8/17/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.5	5	NA	8/21/12 15:57		305910	
Methylcyclohexane	50	U	50	1.4	5	NA	8/21/12 15:57		305910	
Styrene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
Tetrachloroethene (PCE)	25	U	25	1.5	5	NA	8/21/12 15:57		305910	
Toluene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
Trichloroethene (TCE)	460		25	1.1	5	NA	8/21/12 15:57		305910	
Trichlorofluoromethane (CFC 11)	4.2	I	25	1.0	5	NA	8/21/12 15:57		305910	
Vinyl Chloride	600		25	1.6	5	NA	8/21/12 15:57		305910	
cis-1,2-Dichloroethene	700		25	1.5	5	NA	8/21/12 15:57		305910	
cis-1,3-Dichloropropene	25	U	25	1.2	5	NA	8/21/12 15:57		305910	
m,p-Xylenes	25	U	25	1.7	5	NA	8/21/12 15:57		305910	
n-Butyl Acetate	25	U	25	2.0	5	NA	8/21/12 15:57		305910	
o-Xylene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	
trans-1,2-Dichloroethene	13	I	25	1.7	5	NA	8/21/12 15:57		305910	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	8/21/12 15:57		305910	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	8/21/12 15:57	
Dibromofluoromethane	106	89-119	8/21/12 15:57	
Toluene-d8	107	87-121	8/21/12 15:57	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 8/16/12
 Sample Matrix: Water

Service Request: R1205418
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/21/12 11:14

Sample Name: Method Blank
 Lab Code: RQ1209716-03

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\082112\F8801.D\

Analysis Lot: 305910
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	10 U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Collected: NA
Date Received: NA
Date Analyzed: 8/21/12 11:14

Sample Name: Method Blank
Lab Code: RQ1209716-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA8\DATA\082112\F8801.D\

Analysis Lot: 305910
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	8/21/12 11:14	
Dibromofluoromethane	105	89-119	8/21/12 11:14	
Toluene-d8	104	87-121	8/21/12 11:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP PED LC34 FO0552B 8/16/12
 Sample Matrix: Water

Service Request: R1205418
 Date Collected: NA
 Date Received: NA
 Date Analyzed: 8/22/12 11:10

Sample Name: Method Blank
 Lab Code: RQ1209792-03

Units: µg/L
 Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
 Data File Name: J:\ACQUDATA\MSVOA8\DATA\082212\F8852.D\

Analysis Lot: 306125
 Instrument Name: R-MS-08
 Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	18	
78-93-3	2-Butanone (MEK)	10	U	10	0.81	
591-78-6	2-Hexanone	10	U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.67	
67-64-1	Acetone	10	U	10	1.3	
71-43-2	Benzene	5.0	U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.32	
75-25-2	Bromoform	5.0	U	5.0	0.42	
74-83-9	Bromomethane	0.33	I	5.0	0.29	
75-15-0	Carbon Disulfide	10	U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.45	
108-90-7	Chlorobenzene	5.0	U	5.0	0.29	
75-00-3	Chloroethane	5.0	U	5.0	0.24	
67-66-3	Chloroform	5.0	U	5.0	0.25	
74-87-3	Chloromethane	0.39	I	5.0	0.21	
110-82-7	Cyclohexane	10	U	10	0.25	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.46	
75-09-2	Dichloromethane	5.0	U	5.0	0.32	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Collected: NA
Date Received: NA
Date Analyzed: 8/22/12 11:10

Sample Name: Method Blank
Lab Code: RQ1209792-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\082212\F8852.D\

Analysis Lot: 306125
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	8/22/12 11:10	
Dibromofluoromethane	104	89-119	8/22/12 11:10	
Toluene-d8	104	87-121	8/22/12 11:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418**Date Analyzed:** 8/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C**Units:** µg/L**Basis:** NA**Analysis Lot:** 305910**Lab Control Sample**

RQ1209716-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	17.8	20.0	89	72 - 128
1,1,2,2-Tetrachloroethane	20.0	20.0	100	72 - 131
1,1,2-Trichloroethane	19.6	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	16.1	20.0	81	68 - 136
1,1-Dichloroethane (1,1-DCA)	18.8	20.0	94	76 - 124
1,1-Dichloroethene (1,1-DCE)	18.1	20.0	90	72 - 129
1,2,4-Trichlorobenzene	17.4	20.0	87	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.4	20.0	97	62 - 131
1,2-Dibromoethane	20.3	20.0	102	78 - 125
1,2-Dichlorobenzene	18.5	20.0	93	79 - 124
1,2-Dichloroethane	21.8	20.0	109	73 - 127
1,2-Dichloropropane	17.7	20.0	89	80 - 123
1,3-Dichlorobenzene	17.9	20.0	89	78 - 124
1,4-Dichlorobenzene	18.5	20.0	92	78 - 123
n-Butanol	1180	1010	117	70 - 130
2-Butanone (MEK)	20.2	20.0	101	60 - 133
2-Hexanone	20.0	20.0	100	61 - 131
4-Methyl-2-pentanone	20.8	20.0	104	61 - 132
Acetone	20.6	20.0	103	54 - 139
Benzene	17.5	20.0	87	78 - 121
Bromodichloromethane	20.1	20.0	101	80 - 125
Bromoform	18.8	20.0	94	68 - 130
Bromomethane	17.7	20.0	88	57 - 144
Carbon Disulfide	17.1	20.0	86	52 - 140
Carbon Tetrachloride	18.2	20.0	91	68 - 133
Chlorobenzene	18.6	20.0	93	80 - 121
Chloroethane	17.8	20.0	89	71 - 130
Chloroform	19.8	20.0	99	78 - 125
Chloromethane	16.0	20.0	80	61 - 138
Cyclohexane	14.6	20.0	73	57 - 126
Dibromochloromethane	20.7	20.0	104	78 - 133
Dichlorodifluoromethane (CFC 12)	16.9	20.0	84	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Analyzed: 8/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 305910

Lab Control Sample
RQ1209716-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.2	20.0	96	75 - 125
Ethylbenzene	17.5	20.0	88	78 - 123
Isopropylbenzene (Cumene)	16.3	20.0	82	73 - 133
Methyl Acetate	18.2	20.0	91	57 - 157
Methyl tert-Butyl Ether	22.6	20.0	113	75 - 126
Methylcyclohexane	16.0	20.0	80	61 - 125
Styrene	18.8	20.0	94	80 - 132
Tetrachloroethene (PCE)	16.8	20.0	84	72 - 131
Toluene	17.6	20.0	88	78 - 122
Trichloroethene (TCE)	16.7	20.0	84	74 - 127
Trichlorofluoromethane (CFC 11)	18.9	20.0	95	69 - 141
Vinyl Chloride	18.3	20.0	92	72 - 138
cis-1,2-Dichloroethene	18.5	20.0	92	78 - 122
cis-1,3-Dichloropropene	18.4	20.0	92	77 - 125
m,p-Xylenes	35.7	40.0	89	79 - 126
n-Butyl Acetate	20.1	20.0	101	31 - 144
o-Xylene	18.4	20.0	92	77 - 118
trans-1,2-Dichloroethene	17.7	20.0	89	75 - 121
trans-1,3-Dichloropropene	19.8	20.0	99	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Analyzed: 8/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 306125

Lab Control Sample
RQ1209792-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	98	72 - 128
1,1,2,2-Tetrachloroethane	19.9	20.0	99	72 - 131
1,1,2-Trichloroethane	19.7	20.0	98	80 - 122
1,1,2-Trichloro-1,2,2-trifluoroethane	17.5	20.0	87	68 - 136
1,1-Dichloroethane (1,1-DCA)	20.0	20.0	100	76 - 124
1,1-Dichloroethene (1,1-DCE)	19.5	20.0	98	72 - 129
1,2,4-Trichlorobenzene	17.5	20.0	87	70 - 133
1,2-Dibromo-3-chloropropane (DBCP)	19.4	20.0	97	62 - 131
1,2-Dibromoethane	20.6	20.0	103	78 - 125
1,2-Dichlorobenzene	19.4	20.0	97	79 - 124
1,2-Dichloroethane	22.9	20.0	114	73 - 127
1,2-Dichloropropane	19.2	20.0	96	80 - 123
1,3-Dichlorobenzene	18.8	20.0	94	78 - 124
1,4-Dichlorobenzene	19.4	20.0	97	78 - 123
n-Butanol	1110	1010	110	70 - 130
2-Butanone (MEK)	19.6	20.0	98	60 - 133
2-Hexanone	20.3	20.0	101	61 - 131
4-Methyl-2-pentanone	20.3	20.0	101	61 - 132
Acetone	18.1	20.0	91	54 - 139
Benzene	18.5	20.0	92	78 - 121
Bromodichloromethane	21.2	20.0	106	80 - 125
Bromoform	19.4	20.0	97	68 - 130
Bromomethane	20.4	20.0	102	57 - 144
Carbon Disulfide	18.6	20.0	93	52 - 140
Carbon Tetrachloride	20.5	20.0	103	68 - 133
Chlorobenzene	19.6	20.0	98	80 - 121
Chloroethane	18.7	20.0	93	71 - 130
Chloroform	20.9	20.0	105	78 - 125
Chloromethane	18.8	20.0	94	61 - 138
Cyclohexane	16.1	20.0	81	57 - 126
Dibromochloromethane	21.3	20.0	106	78 - 133
Dichlorodifluoromethane (CFC 12)	19.0	20.0	95	45 - 159

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B 8/16/12
Sample Matrix: Water

Service Request: R1205418
Date Analyzed: 8/22/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 306125

Lab Control Sample
RQ1209792-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.9	20.0	100	75 - 125
Ethylbenzene	18.9	20.0	95	78 - 123
Isopropylbenzene (Cumene)	17.7	20.0	88	73 - 133
Methyl Acetate	18.2	20.0	91	57 - 157
Methyl tert-Butyl Ether	23.0	20.0	115	75 - 126
Methylcyclohexane	18.1	20.0	91	61 - 125
Styrene	19.9	20.0	99	80 - 132
Tetrachloroethene (PCE)	18.2	20.0	91	72 - 131
Toluene	18.6	20.0	93	78 - 122
Trichloroethene (TCE)	18.2	20.0	91	74 - 127
Trichlorofluoromethane (CFC 11)	21.2	20.0	106	69 - 141
Vinyl Chloride	19.9	20.0	99	72 - 138
cis-1,2-Dichloroethene	19.4	20.0	97	78 - 122
cis-1,3-Dichloropropene	19.2	20.0	96	77 - 125
m,p-Xylenes	38.7	40.0	97	79 - 126
n-Butyl Acetate	20.6	20.0	103	31 - 144
o-Xylene	19.5	20.0	97	77 - 118
trans-1,2-Dichloroethene	18.8	20.0	94	75 - 121
trans-1,3-Dichloropropene	20.2	20.0	101	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH.585-288-5380 FAX.585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B

Project Manager: Rebecca Daprato Company: Geosyntec Consultants

Company/Address: 6770 S. Washington Ave. Ste. 3 Phone: 321-269-5880

City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813

Sampler's Signature:

Analysis Requested

Number of Containers
 VOCs (8260C) plus n-butyl acetate

Sample ID	Date	Time	LAB ID	Matrix	REMARKS
LC34-RW0007-038.5-20120816	8/16/12	1305	001	W	
LC34-RW0008-052.0-20120816	8/16/12	1332	002	W	

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDD?: NASA KEDD

RECEIVED BY:
 Signature:
 Printed Name: JOSEPH BARTLETT
 Firm: GEOSYNTEC
 Date/Time: 8/16/12 - 1630

Comments/Special Instructions:

R1205418
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B 8/16/12

RECEIVED BY:
 Signature:
 Printed Name: Amy Hentschko
 Firm: ASG
 Date/Time: 8/17/12 0925

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____



Cooler Receipt and Preservation Check Form

Project/Client: GeoSyntec Folder Number: R120518

Cooler received on 8/17/12 by: ALT COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc.)? YES NO
- Did all bottles arrive in good condition (unbroken)? YES NO
- Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
- Were Ice or Ice packs present? YES NO
- Where did the bottles originate? ALS/ROC CLIENT
- Temperature of cooler(s) upon receipt: 4.5°

Is the temperature within 0° - 6° C?: Yes No

If No, Explain Below: No Yes

Date/Time Temperatures Taken: 8/17/12 0937

Thermometer ID: IR GUN#3 / IR GUN#4 Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location R-002 by ALT on 8/17/12 at 0939
5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: UB 8/17/12

Cooler Breakdown: Date: 8/17/12 Time: 1340 by: ALT

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	YES NO		Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-			*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet			
	Zn Aceta	-	-						
	HCl	*	*	covered by client label ALT 8/17/12					

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

Bottle lot numbers: covered by client label
Other Comments: _____

PC Secondary Review: [Signature]
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm : WC > 1 in. diameter



September 27, 2012

Service Request No: R1206035

Dr. Rebecca Daprato
GeoSyntec Consultants
11490 Westheimer
Suite 150
Houston, TX 77077

Laboratory Results for: ESTCP PED LC34 FO0552B

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on September 12, 2012. For your reference, these analyses have been assigned our service request number **R1206035**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

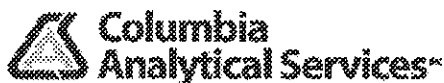
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 53



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (9/11/12)
Sample Matrix: Water

Service Request No.: R1206035
Date Received: 9/12/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Eight (8) water samples were collected by the client on 9/11/12 and were received for analysis at Columbia Analytical Services on 7/20/12 via a national courier. The samples were received at a cooler temperature of 3.3°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received.

Volatile Organic Compounds GC/MS

Eight (8) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C and Dissolved Gases by GC method RSK-175.

The initial calibration criteria was met for these samples. The Continuing Calibration Verification (CCV) %D for Bromomethane was outside the 20% limit on the 9/13/12 run. Any hits for this compound on the associated run should be considered as estimated, however the samples were non-detect for this compound and therefore unaffected.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits.

The samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The Laboratory Method Blanks were free from contamination except for 1,2,4-Trichlorobenzene and Bromomethane on the 9/13/12 and 9/17/12 8260C runs. Affected data is flagged as "V".

No other analytical or QC problems were encountered.

Approved by

 Date 9/27/12

00002

Inorganic Parameters

Eight (8) samples were analyzed for TOC by method 9060A. The average of 4 runs are reported for each sample.

All Initial and Continuing Calibration criteria was met.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were acceptable.

The samples were run within holding time.

No problems were encountered during the analysis of these samples.

Approved by Karen Burke Date 9/27/12

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1206035

<u>Lab ID</u>	<u>Client ID</u>
R1206035-001	LC34-BW0002A-024.5-20120911
R1206035-002	LC34-BW0002B-031.5-20120911
R1206035-003	LC34-BW0002C-038.5-20120911
R1206035-004	LC34-BW0002D-045.5-20120911
R1206035-005	LC34-BW0002E-052.5-20120911
R1206035-006	LC34-BW0002F-059.5-20120911
R1206035-007	LC34-BW0003A-024.5-20120911
R1206035-008	LC34-BW0003B-031.5-20120911

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002A-024.5-20120911
Lab Code: R1206035-001

Service Request: R1206035
Date Collected: 9/11/12 0907
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	2.5		mg/L	1.0	1	NA	9/17/12 19:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 0907
Date Received: 9/12/12
Date Analyzed: 9/14/12 00:01

Sample Name: LC34-BW0002A-024.5-20120911
Lab Code: R1206035-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\091312\T1383.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	60	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	0.29 IV	5.0	0.29	
75-15-0	Carbon Disulfide	0.22 I	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 0907
Date Received: 9/12/12
Date Analyzed: 9/14/12 00:01

Sample Name: LC34-BW0002A-024.5-20120911
Lab Code: R1206035-001

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\091312\T1383.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.29	
108-87-2	Methylcyclohexane	10 U	10	0.27	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.30	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.6	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	130	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	49	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.39	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	13	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 00:01	
Dibromofluoromethane	103	89-119	9/14/12 00:01	
Toluene-d8	100	87-121	9/14/12 00:01	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Sample Name: LC34-BW0002A-024.5-20120911
Lab Code: R1206035-001

Service Request: R1206035
Date Collected: 9/11/12 0907
Date Received: 9/12/12
Date Analyzed: 9/18/12 10:28

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star040.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	42		1.0	
74-82-8	Methane	39		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002B-031.5-20120911
Lab Code: R1206035-002

Service Request: R1206035
Date Collected: 9/11/12 0945
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.7		mg/L	1.0	1	NA	9/17/12 20:48	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 0945
Date Received: 9/12/12
Date Analyzed: 9/17/12 18:08

Sample Name: LC34-BW0002B-031.5-20120911
Lab Code: R1206035-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1439.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13	U	13	0.90	
79-34-5	1,1,2,2-Tetrachloroethane	13	U	13	0.63	
79-00-5	1,1,2-Trichloroethane	13	U	13	0.86	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	36		13	0.78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13	U	13	0.50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13	U	13	1.5	
120-82-1	1,2,4-Trichlorobenzene	13	U	13	0.58	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.9	
106-93-4	1,2-Dibromoethane	13	U	13	0.60	
95-50-1	1,2-Dichlorobenzene	13	U	13	0.53	
107-06-2	1,2-Dichloroethane	13	U	13	0.90	
78-87-5	1,2-Dichloropropane	13	U	13	0.50	
541-73-1	1,3-Dichlorobenzene	13	U	13	0.50	
106-46-7	1,4-Dichlorobenzene	13	U	13	0.50	
71-36-3	n-Butanol	630	U	630	44	
78-93-3	2-Butanone (MEK)	25	U	25	2.1	
591-78-6	2-Hexanone	25	U	25	4.2	
108-10-1	4-Methyl-2-pentanone	25	U	25	1.7	
67-64-1	Acetone	25	U	25	3.1	
71-43-2	Benzene	13	U	13	0.50	
75-27-4	Bromodichloromethane	13	U	13	0.80	
75-25-2	Bromoform	13	U	13	1.1	
74-83-9	Bromomethane	1.1	IV	13	0.73	
75-15-0	Carbon Disulfide	25	U	25	0.55	
56-23-5	Carbon Tetrachloride	13	U	13	1.2	
108-90-7	Chlorobenzene	13	U	13	0.73	
75-00-3	Chloroethane	13	U	13	0.60	
67-66-3	Chloroform	13	U	13	0.63	
74-87-3	Chloromethane	13	U	13	0.53	
110-82-7	Cyclohexane	25	U	25	0.63	
124-48-1	Dibromochloromethane	13	U	13	0.78	
75-71-8	Dichlorodifluoromethane (CFC 12)	13	U	13	1.2	
75-09-2	Dichloromethane	13	U	13	0.80	
100-41-4	Ethylbenzene	13	U	13	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 0945
Date Received: 9/12/12
Date Analyzed: 9/17/12 18:08

Sample Name: LC34-BW0002B-031.5-20120911
Lab Code: R1206035-002

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1439.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13	U	13	0.50	
79-20-9	Methyl Acetate	25	U	25	1.1	
1634-04-4	Methyl tert-Butyl Ether	13	U	13	0.73	
108-87-2	Methylcyclohexane	25	U	25	0.68	
100-42-5	Styrene	13	U	13	0.50	
127-18-4	Tetrachloroethene (PCE)	13	U	13	0.75	
108-88-3	Toluene	13	U	13	0.50	
79-01-6	Trichloroethene (TCE)	9.8	I	13	0.55	
75-69-4	Trichlorofluoromethane (CFC 11)	13	U	13	0.50	
75-01-4	Vinyl Chloride	330		13	0.80	
156-59-2	cis-1,2-Dichloroethene	170		13	0.75	
10061-01-5	cis-1,3-Dichloropropene	13	U	13	0.60	
179601-23-1	m,p-Xylenes	13	U	13	0.83	
123-86-4	n-Butyl Acetate	13	U	13	0.98	
95-47-6	o-Xylene	13	U	13	0.50	
156-60-5	trans-1,2-Dichloroethene	23		13	0.83	
10061-02-6	trans-1,3-Dichloropropene	13	U	13	0.50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/17/12 18:08	
Dibromofluoromethane	100	89-119	9/17/12 18:08	
Toluene-d8	99	87-121	9/17/12 18:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 0945
Date Received: 9/12/12
Date Analyzed: 9/18/12 10:50

Sample Name: LC34-BW0002B-031.5-20120911
Lab Code: R1206035-002

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star042.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	2.0 U	2.0	
74-85-1	Ethene	44	2.0	
74-82-8	Methane	140	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120911
Lab Code: R1206035-003

Service Request: R1206035
Date Collected: 9/11/12 1013
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	77.9	mg/L	4.0	4	NA	9/17/12 22:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1013
Date Received: 9/12/12
Date Analyzed: 9/17/12 19:47

Sample Name: LC34-BW0002C-038.5-20120911
Lab Code: R1206035-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1442.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	36	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	25	
79-00-5	1,1,2-Trichloroethane	500	U	500	34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500	U	500	57	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	74	
106-93-4	1,2-Dibromoethane	500	U	500	24	
95-50-1	1,2-Dichlorobenzene	500	U	500	21	
107-06-2	1,2-Dichloroethane	500	U	500	36	
78-87-5	1,2-Dichloropropane	500	U	500	20	
541-73-1	1,3-Dichlorobenzene	500	U	500	20	
106-46-7	1,4-Dichlorobenzene	500	U	500	20	
71-36-3	n-Butanol	25000	U	25000	1800	
78-93-3	2-Butanone (MEK)	1000	U	1000	81	
591-78-6	2-Hexanone	1000	U	1000	170	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	67	
67-64-1	Acetone	1000	U	1000	130	
71-43-2	Benzene	500	U	500	20	
75-27-4	Bromodichloromethane	500	U	500	32	
75-25-2	Bromoform	500	U	500	42	
74-83-9	Bromomethane	30	I	500	29	
75-15-0	Carbon Disulfide	1000	U	1000	22	
56-23-5	Carbon Tetrachloride	500	U	500	45	
108-90-7	Chlorobenzene	500	U	500	29	
75-00-3	Chloroethane	500	U	500	24	
67-66-3	Chloroform	500	U	500	25	
74-87-3	Chloromethane	500	U	500	21	
110-82-7	Cyclohexane	1000	U	1000	25	
124-48-1	Dibromochloromethane	500	U	500	31	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	46	
75-09-2	Dichloromethane	500	U	500	32	
100-41-4	Ethylbenzene	500	U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1013
Date Received: 9/12/12
Date Analyzed: 9/17/12 19:47

Sample Name: LC34-BW0002C-038.5-20120911
Lab Code: R1206035-003

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1442.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	43	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	29	
108-87-2	Methylcyclohexane	1000	U	1000	27	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	30	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	500	U	500	22	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	11000		500	32	
156-59-2	cis-1,2-Dichloroethene	11000		500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	24	
179601-23-1	m,p-Xylenes	500	U	500	33	
123-86-4	n-Butyl Acetate	500	U	500	39	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	280	I	500	33	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/17/12 19:47	
Dibromofluoromethane	103	89-119	9/17/12 19:47	
Toluene-d8	99	87-121	9/17/12 19:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002C-038.5-20120911
Lab Code: R1206035-003

Service Request: R1206035
Date Collected: 9/11/12 1013
Date Received: 9/12/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution	Date	Date	Extraction Analysis		Note
				Factor	Extracted	Analyzed	Lot	Lot	
Ethane	52		10	10	NA	9/18/12 11:03		310015	
Ethene	890		10	10	NA	9/18/12 11:03		310015	
Methane	1800		25	25	NA	9/18/12 13:19		310015	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002D-045.5-20120911
Lab Code: R1206035-004

Service Request: R1206035
Date Collected: 9/11/12 1151
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	87		mg/L	10	10	NA	9/17/12 22:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1151
Date Received: 9/12/12
Date Analyzed: 9/17/12 19:14

Sample Name: LC34-BW0002D-045.5-20120911
Lab Code: R1206035-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1441.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	250	U	250	18	
79-34-5	1,1,2,2-Tetrachloroethane	250	U	250	13	
79-00-5	1,1,2-Trichloroethane	250	U	250	17	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	250	U	250	16	
75-34-3	1,1-Dichloroethane (1,1-DCA)	250	U	250	10	
75-35-4	1,1-Dichloroethene (1,1-DCE)	250	U	250	29	
120-82-1	1,2,4-Trichlorobenzene	250	U	250	12	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	250	U	250	37	
106-93-4	1,2-Dibromoethane	250	U	250	12	
95-50-1	1,2-Dichlorobenzene	250	U	250	11	
107-06-2	1,2-Dichloroethane	250	U	250	18	
78-87-5	1,2-Dichloropropane	250	U	250	10	
541-73-1	1,3-Dichlorobenzene	250	U	250	10	
106-46-7	1,4-Dichlorobenzene	250	U	250	10	
71-36-3	n-Butanol	13000	U	13000	870	
78-93-3	2-Butanone (MEK)	500	U	500	41	
591-78-6	2-Hexanone	500	U	500	83	
108-10-1	4-Methyl-2-pentanone	500	U	500	34	
67-64-1	Acetone	500	U	500	62	
71-43-2	Benzene	250	U	250	10	
75-27-4	Bromodichloromethane	250	U	250	16	
75-25-2	Bromoform	250	U	250	21	
74-83-9	Bromomethane	17	I	250	15	
75-15-0	Carbon Disulfide	500	U	500	11	
56-23-5	Carbon Tetrachloride	250	U	250	23	
108-90-7	Chlorobenzene	250	U	250	15	
75-00-3	Chloroethane	250	U	250	12	
67-66-3	Chloroform	250	U	250	13	
74-87-3	Chloromethane	250	U	250	11	
110-82-7	Cyclohexane	500	U	500	13	
124-48-1	Dibromochloromethane	250	U	250	16	
75-71-8	Dichlorodifluoromethane (CFC 12)	250	U	250	23	
75-09-2	Dichloromethane	250	U	250	16	
100-41-4	Ethylbenzene	250	U	250	10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 11:51
Date Received: 9/12/12
Date Analyzed: 9/17/12 19:14

Sample Name: LC34-BW0002D-045.5-20120911
Lab Code: R1206035-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1441.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 50

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	250 U	250	10	
79-20-9	Methyl Acetate	500 U	500	22	
1634-04-4	Methyl tert-Butyl Ether	250 U	250	15	
108-87-2	Methylcyclohexane	500 U	500	14	
100-42-5	Styrene	250 U	250	10	
127-18-4	Tetrachloroethene (PCE)	250 U	250	15	
108-88-3	Toluene	250 U	250	10	
79-01-6	Trichloroethene (TCE)	250 U	250	11	
75-69-4	Trichlorofluoromethane (CFC 11)	250 U	250	10	
75-01-4	Vinyl Chloride	9100	250	16	
156-59-2	cis-1,2-Dichloroethene	40 I	250	15	
10061-01-5	cis-1,3-Dichloropropene	250 U	250	12	
179601-23-1	m,p-Xylenes	250 U	250	17	
123-86-4	n-Butyl Acetate	250 U	250	20	
95-47-6	o-Xylene	250 U	250	10	
156-60-5	trans-1,2-Dichloroethene	79 I	250	17	
10061-02-6	trans-1,3-Dichloropropene	250 U	250	10	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	9/17/12 19:14	
Dibromofluoromethane	104	89-119	9/17/12 19:14	
Toluene-d8	98	87-121	9/17/12 19:14	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1151
Date Received: 9/12/12
Date Analyzed: 9/18/12 13:38

Sample Name: LC34-BW0002D-045.5-20120911
Lab Code: R1206035-004

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star052.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	36		20	
74-85-1	Ethene	1000		20	
74-82-8	Methane	1600		20	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002E-052.5-20120911
Lab Code: R1206035-005

Service Request: R1206035
Date Collected: 9/11/12 1122
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	4.9		mg/L	1.0	1	NA	9/17/12 23:27	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1122
Date Received: 9/12/12
Date Analyzed: 9/13/12 22:55

Sample Name: LC34-BW0002E-052.5-20120911
Lab Code: R1206035-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\091312\T1381.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.37 I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	0.73 I	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1122
Date Received: 9/12/12
Date Analyzed: 9/13/12 22:55

Sample Name: LC34-BW0002E-052.5-20120911
Lab Code: R1206035-005

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\091312\T1381.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	2.6	I	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	23		5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	8.1		5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	1.2	I	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/13/12 22:55	
Dibromofluoromethane	102	89-119	9/13/12 22:55	
Toluene-d8	101	87-121	9/13/12 22:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1122
Date Received: 9/12/12
Date Analyzed: 9/18/12 11:15

Sample Name: LC34-BW0002E-052.5-20120911
Lab Code: R1206035-005

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star044.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	3.4		2.0	
74-85-1	Ethene	160		2.0	
74-82-8	Methane	77		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120911
Lab Code: R1206035-006

Service Request: R1206035
Date Collected: 9/11/12 1048
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.3		mg/L	1.0	1	NA	9/17/12 00:07	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1048
Date Received: 9/12/12
Date Analyzed: 9/13/12 23:28

Sample Name: LC34-BW0002F-059.5-20120911
Lab Code: R1206035-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\091312\T1382.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.81 I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	1.8 I	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1048
Date Received: 9/12/12
Date Analyzed: 9/13/12 23:28

Sample Name: LC34-BW0002F-059.5-20120911
Lab Code: R1206035-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUADATA\msvoa12\Data\091312\T1382.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	6.4		5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	130		5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	40		5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.1		5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	9/13/12 23:28	
Dibromofluoromethane	106	89-119	9/13/12 23:28	
Toluene-d8	100	87-121	9/13/12 23:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0002F-059.5-20120911
Lab Code: R1206035-006

Service Request: R1206035
Date Collected: 9/11/12 1048
Date Received: 9/12/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution	Date	Date	Extraction Analysis		Note
				Factor	Extracted	Analyzed	Lot	Lot	
Ethane	1.6		1.0	1	NA	9/18/12 11:26		310015	
Ethene	110		2.0	2	NA	9/18/12 11:36		310015	
Methane	22		1.0	1	NA	9/18/12 11:26		310015	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20120911
Lab Code: R1206035-007

Service Request: R1206035
Date Collected: 9/11/12 1318
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.3		mg/L	1.0	1	NA	9/18/12 00:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1318
Date Received: 9/12/12
Date Analyzed: 9/17/12 18:41

Sample Name: LC34-BW0003A-024.5-20120911
Lab Code: R1206035-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA12\DATA\091712\T1440.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	50	U	50	3.6	
79-34-5	1,1,2,2-Tetrachloroethane	50	U	50	2.5	
79-00-5	1,1,2-Trichloroethane	50	U	50	3.5	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	690		50	3.1	
75-34-3	1,1-Dichloroethane (1,1-DCA)	50	U	50	2.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	50	U	50	5.7	
120-82-1	1,2,4-Trichlorobenzene	50	U	50	2.4	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	50	U	50	7.4	
106-93-4	1,2-Dibromoethane	50	U	50	2.4	
95-50-1	1,2-Dichlorobenzene	50	U	50	2.1	
107-06-2	1,2-Dichloroethane	50	U	50	3.6	
78-87-5	1,2-Dichloropropane	50	U	50	2.0	
541-73-1	1,3-Dichlorobenzene	50	U	50	2.0	
106-46-7	1,4-Dichlorobenzene	50	U	50	2.0	
71-36-3	n-Butanol	2500	U	2500	180	
78-93-3	2-Butanone (MEK)	100	U	100	8.2	
591-78-6	2-Hexanone	100	U	100	17	
108-10-1	4-Methyl-2-pentanone	100	U	100	6.7	
67-64-1	Acetone	26	I	100	13	
71-43-2	Benzene	50	U	50	2.0	
75-27-4	Bromodichloromethane	50	U	50	3.2	
75-25-2	Bromoform	50	U	50	4.2	
74-83-9	Bromomethane	4.9	I	50	2.9	
75-15-0	Carbon Disulfide	100	U	100	2.2	
56-23-5	Carbon Tetrachloride	50	U	50	4.5	
108-90-7	Chlorobenzene	50	U	50	2.9	
75-00-3	Chloroethane	50	U	50	2.4	
67-66-3	Chloroform	50	U	50	2.5	
74-87-3	Chloromethane	50	U	50	2.1	
110-82-7	Cyclohexane	100	U	100	2.5	
124-48-1	Dibromochloromethane	50	U	50	3.1	
75-71-8	Dichlorodifluoromethane (CFC 12)	50	U	50	4.7	
75-09-2	Dichloromethane	50	U	50	3.2	
100-41-4	Ethylbenzene	50	U	50	2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1318
Date Received: 9/12/12
Date Analyzed: 9/17/12 18:41

Sample Name: LC34-BW0003A-024.5-20120911
Lab Code: R1206035-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\MSVOA12\DATA\091712\T1440.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	50	U	50	2.0	
79-20-9	Methyl Acetate	100	U	100	4.3	
1634-04-4	Methyl tert-Butyl Ether	50	U	50	2.9	
108-87-2	Methylcyclohexane	100	U	100	2.7	
100-42-5	Styrene	50	U	50	2.0	
127-18-4	Tetrachloroethene (PCE)	50	U	50	3.0	
108-88-3	Toluene	50	U	50	2.0	
79-01-6	Trichloroethene (TCE)	2.4	I	50	2.2	
75-69-4	Trichlorofluoromethane (CFC 11)	50	U	50	2.0	
75-01-4	Vinyl Chloride	210		50	3.2	
156-59-2	cis-1,2-Dichloroethene	1600		50	3.0	
10061-01-5	cis-1,3-Dichloropropene	50	U	50	2.4	
179601-23-1	m,p-Xylenes	50	U	50	3.4	
123-86-4	n-Butyl Acetate	50	U	50	4.0	
95-47-6	o-Xylene	50	U	50	2.0	
156-60-5	trans-1,2-Dichloroethene	55		50	3.4	
10061-02-6	trans-1,3-Dichloropropene	50	U	50	2.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	9/17/12 18:41	
Dibromofluoromethane	102	89-119	9/17/12 18:41	
Toluene-d8	98	87-121	9/17/12 18:41	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0003A-024.5-20120911
Lab Code: R1206035-007

Service Request: R1206035
Date Collected: 9/11/12 1318
Date Received: 9/12/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution	Date	Date	Extraction Analysis		Note
				Factor	Extracted	Analyzed	Lot	Lot	
Ethane	1.0	U	1.0	1	NA	9/18/12 11:47		310015	
Ethene	11		1.0	1	NA	9/18/12 11:47		310015	
Methane	110		2.0	2	NA	9/18/12 12:51		310015	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: LC34-BW0003B-031.5-20120911
Lab Code: R1206035-008

Service Request: R1206035
Date Collected: 9/11/12 1342
Date Received: 9/12/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.3		mg/L	1.0	1	NA	9/18/12 02:46	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1342
Date Received: 9/12/12
Date Analyzed: 9/14/12 01:39

Sample Name: LC34-BW0003B-031.5-20120911
Lab Code: R1206035-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\091312\T1386.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100	U	100	7.2	
79-34-5	1,1,2,2-Tetrachloroethane	100	U	100	5.0	
79-00-5	1,1,2-Trichloroethane	100	U	100	6.9	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	490		100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100	U	100	12	
120-82-1	1,2,4-Trichlorobenzene	100	U	100	4.7	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	15	
106-93-4	1,2-Dibromoethane	100	U	100	4.8	
95-50-1	1,2-Dichlorobenzene	100	U	100	4.2	
107-06-2	1,2-Dichloroethane	100	U	100	7.2	
78-87-5	1,2-Dichloropropane	100	U	100	4.0	
541-73-1	1,3-Dichlorobenzene	100	U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100	U	100	4.0	
71-36-3	n-Butanol	5000	U	5000	350	
78-93-3	2-Butanone (MEK)	200	U	200	17	
591-78-6	2-Hexanone	200	U	200	34	
108-10-1	4-Methyl-2-pentanone	200	U	200	14	
67-64-1	Acetone	200	U	200	25	
71-43-2	Benzene	100	U	100	4.0	
75-27-4	Bromodichloromethane	100	U	100	6.4	
75-25-2	Bromoform	100	U	100	8.4	
74-83-9	Bromomethane	100	U	100	5.8	
75-15-0	Carbon Disulfide	200	U	200	4.4	
56-23-5	Carbon Tetrachloride	100	U	100	9.0	
108-90-7	Chlorobenzene	100	U	100	5.8	
75-00-3	Chloroethane	100	U	100	4.8	
67-66-3	Chloroform	100	U	100	5.0	
74-87-3	Chloromethane	100	U	100	4.2	
110-82-7	Cyclohexane	200	U	200	5.0	
124-48-1	Dibromochloromethane	100	U	100	6.2	
75-71-8	Dichlorodifluoromethane (CFC 12)	100	U	100	9.3	
75-09-2	Dichloromethane	100	U	100	6.4	
100-41-4	Ethylbenzene	100	U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1342
Date Received: 9/12/12
Date Analyzed: 9/14/12 01:39

Sample Name: LC34-BW0003B-031.5-20120911
Lab Code: R1206035-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\msvoa12\Data\091312\T1386.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	8.6	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	5.8	
108-87-2	Methylcyclohexane	200	U	200	5.4	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	6.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	100	U	100	4.4	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	350		100	6.4	
156-59-2	cis-1,2-Dichloroethene	2100		100	6.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.8	
179601-23-1	m,p-Xylenes	100	U	100	6.7	
123-86-4	n-Butyl Acetate	100	U	100	7.9	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	82	I	100	6.7	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 01:39	
Dibromofluoromethane	103	89-119	9/14/12 01:39	
Toluene-d8	100	87-121	9/14/12 01:39	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: 9/11/12 1342
Date Received: 9/12/12
Date Analyzed: 9/18/12 13:03

Sample Name: LC34-BW0003B-031.5-20120911
Lab Code: R1206035-008

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star050.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	12		1.0	
74-82-8	Methane	99		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1206035-MB

Service Request: R1206035
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/17/12 18:08	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: NA
Date Received: NA
Date Analyzed: 9/13/12 17:58

Sample Name: Method Blank
Lab Code: RQ1210742-05

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\091312\T1372.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	0.30	I	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	18	
78-93-3	2-Butanone (MEK)	10	U	10	0.81	
591-78-6	2-Hexanone	10	U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.67	
67-64-1	Acetone	10	U	10	1.3	
71-43-2	Benzene	5.0	U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.32	
75-25-2	Bromoform	5.0	U	5.0	0.42	
74-83-9	Bromomethane	0.41	I	5.0	0.29	
75-15-0	Carbon Disulfide	10	U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.45	
108-90-7	Chlorobenzene	5.0	U	5.0	0.29	
75-00-3	Chloroethane	5.0	U	5.0	0.24	
67-66-3	Chloroform	5.0	U	5.0	0.25	
74-87-3	Chloromethane	5.0	U	5.0	0.21	
110-82-7	Cyclohexane	10	U	10	0.25	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.46	
75-09-2	Dichloromethane	5.0	U	5.0	0.32	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: NA
Date Received: NA
Date Analyzed: 9/13/12 17:58

Sample Name: Method Blank
Lab Code: RQ1210742-05

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUATA\msvoa12\Data\091312\T1372.D\

Analysis Lot: 309313
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.29	
108-87-2	Methylcyclohexane	10 U	10	0.27	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.30	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0 U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0 U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.39	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0 U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/13/12 17:58	
Dibromofluoromethane	103	89-119	9/13/12 17:58	
Toluene-d8	99	87-121	9/13/12 17:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: NA
Date Received: NA
Date Analyzed: 9/17/12 17:33

Sample Name: Method Blank
Lab Code: RQ1210869-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQU\DATA\MSVOA12\DATA\091712\T1438.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	0.28 I	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	0.51 I	5.0	0.29	
75-15-0	Carbon Disulfide	10 U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: NA
Date Received: NA
Date Analyzed: 9/17/12 17:33

Sample Name: Method Blank
Lab Code: RQ1210869-04

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQDATA\MSVOA12\DATA\091712\T1438.D\

Analysis Lot: 309756
Instrument Name: R-MS-12
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	9/17/12 17:33	
Dibromofluoromethane	101	89-119	9/17/12 17:33	
Toluene-d8	100	87-121	9/17/12 17:33	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Collected: NA
Date Received: NA
Date Analyzed: 9/18/12 09:08

Sample Name: Method Blank
Lab Code: RQ1210947-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star016.run

Analysis Lot: 310015
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	1.0 U	1.0	
74-85-1	Ethene	1.0 U	1.0	
74-82-8	Methane	1.0 U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Analyzed: 9/17/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1206035-LCS			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC), Average	9060A	9.55	10.0	95	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035

Date Analyzed: 9/13/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309313

Analyte Name	Lab Control Sample RQ1210742-03			Duplicate Lab Control Sample RQ1210742-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	22.3	20.0	112	21.7	20.0	108	67 - 121	3	30
1,1,2,2-Tetrachloroethane	19.4	20.0	97	18.4	20.0	92	72 - 124	5	30
1,1,2-Trichloroethane	19.3	20.0	96	19.1	20.0	95	81 - 117	<1	30
1,1,2-Trichloro-1,2,2-trifluoroethane	21.5	20.0	107	20.6	20.0	103	60 - 122	4	30
1,1-Dichloroethane (1,1-DCA)	22.7	20.0	113	21.7	20.0	108	76 - 124	4	30
1,1-Dichloroethene (1,1-DCE)	22.7	20.0	114	21.9	20.0	110	67 - 119	4	30
1,2,4-Trichlorobenzene	23.3	20.0	117	22.3	20.0	111	70 - 128	5	30
1,2-Dibromo-3-chloropropane (DBCP)	19.2	20.0	96	18.7	20.0	94	64 - 131	3	30
1,2-Dibromoethane	20.5	20.0	102	20.4	20.0	102	81 - 118	<1	30
1,2-Dichlorobenzene	20.9	20.0	104	20.4	20.0	102	80 - 119	2	30
1,2-Dichloroethane	20.9	20.0	105	20.2	20.0	101	72 - 130	4	30
1,2-Dichloropropane	21.6	20.0	108	20.4	20.0	102	83 - 119	6	30
1,3-Dichlorobenzene	21.1	20.0	106	20.5	20.0	103	79 - 121	3	30
1,4-Dichlorobenzene	21.1	20.0	105	20.8	20.0	104	79 - 119	1	30
n-Butanol	743	1010	74	684	1010	68	49 - 182	8	30
2-Butanone (MEK)	18.4	20.0	92	18.4	20.0	92	60 - 133	<1	30
2-Hexanone	18.1	20.0	91	17.9	20.0	89	61 - 131	2	30
4-Methyl-2-pentanone	19.3	20.0	97	19.1	20.0	95	61 - 132	1	30
Acetone	18.3	20.0	92	19.3	20.0	97	64 - 133	5	30
Benzene	21.5	20.0	107	20.6	20.0	103	78 - 118	4	30
Bromodichloromethane	22.2	20.0	111	21.4	20.0	107	79 - 123	4	30
Bromoform	22.0	20.0	110	21.0	20.0	105	69 - 126	5	30
Bromomethane	17.8	20.0	89	17.0	20.0	85	49 - 124	5	30
Carbon Disulfide	23.0	20.0	115	23.1	20.0	115	67 - 138	<1	30
Carbon Tetrachloride	23.3	20.0	116	22.2	20.0	111	64 - 129	5	30
Chlorobenzene	21.0	20.0	105	20.4	20.0	102	80 - 121	3	30
Chloroethane	19.8	20.0	99	18.7	20.0	93	72 - 130	6	30
Chloroform	21.4	20.0	107	20.3	20.0	102	75 - 123	5	30
Chloromethane	17.8	20.0	89	17.7	20.0	89	55 - 139	<1	30
Cyclohexane	19.5	20.0	97	18.7	20.0	93	55 - 132	4	30
Dibromochloromethane	21.9	20.0	110	21.0	20.0	105	78 - 127	4	30
Dichlorodifluoromethane (CFC 12)	21.6	20.0	108	19.7	20.0	99	45 - 147	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Analyzed: 9/13/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309313

Analyte Name	Lab Control Sample RQ1210742-03			Duplicate Lab Control Sample RQ1210742-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Dichloromethane	22.0	20.0	110	20.9	20.0	104	73 - 122	5	30
Ethylbenzene	21.3	20.0	106	20.0	20.0	100	75 - 123	6	30
Isopropylbenzene (Cumene)	22.5	20.0	112	22.2	20.0	111	75 - 139	1	30
Methyl Acetate	20.1	20.0	101	20.8	20.0	104	65 - 131	3	30
Methyl tert-Butyl Ether	21.4	20.0	107	20.9	20.0	104	75 - 116	3	30
Methylcyclohexane	19.5	20.0	97	18.5	20.0	93	59 - 127	5	30
Styrene	20.7	20.0	104	20.1	20.0	101	80 - 121	3	30
Tetrachloroethene (PCE)	21.1	20.0	106	21.3	20.0	107	71 - 127	<1	30
Toluene	21.5	20.0	108	20.8	20.0	104	77 - 120	3	30
Trichloroethene (TCE)	21.1	20.0	105	20.4	20.0	102	75 - 122	3	30
Trichlorofluoromethane (CFC 11)	24.4	20.0	122	22.9	20.0	114	64 - 134	6	30
Vinyl Chloride	21.3	20.0	107	20.1	20.0	100	68 - 139	6	30
cis-1,2-Dichloroethene	21.4	20.0	107	20.6	20.0	103	77 - 123	4	30
cis-1,3-Dichloropropene	20.2	20.0	101	19.6	20.0	98	77 - 125	3	30
m,p-Xylenes	43.4	40.0	108	42.3	40.0	106	77 - 124	3	30
n-Butyl Acetate	19.8	20.0	99	19.5	20.0	97	61 - 126	1	30
o-Xylene	21.0	20.0	105	20.2	20.0	101	77 - 131	3	30
trans-1,2-Dichloroethene	21.4	20.0	107	20.7	20.0	103	72 - 120	3	30
trans-1,3-Dichloropropene	20.1	20.0	100	19.4	20.0	97	69 - 127	4	30

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035

Date Analyzed: 9/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309756

Lab Control Sample
RQ1210869-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	99	67 - 121
1,1,2,2-Tetrachloroethane	19.2	20.0	96	72 - 124
1,1,2-Trichloroethane	20.0	20.0	100	81 - 117
1,1,2-Trichloro-1,2,2-trifluoroethane	19.2	20.0	96	60 - 122
1,1-Dichloroethane (1,1-DCA)	20.5	20.0	103	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.3	20.0	101	67 - 119
1,2,4-Trichlorobenzene	23.5	20.0	118	70 - 128
1,2-Dibromo-3-chloropropane (DBCP)	19.9	20.0	99	64 - 131
1,2-Dibromoethane	20.5	20.0	103	81 - 118
1,2-Dichlorobenzene	20.0	20.0	100	80 - 119
1,2-Dichloroethane	19.5	20.0	97	72 - 130
1,2-Dichloropropane	20.4	20.0	102	83 - 119
1,3-Dichlorobenzene	19.8	20.0	99	79 - 121
1,4-Dichlorobenzene	20.2	20.0	101	79 - 119
n-Butanol	698	1010	69	49 - 182
2-Butanone (MEK)	18.2	20.0	91	60 - 133
2-Hexanone	17.9	20.0	90	61 - 131
4-Methyl-2-pentanone	19.0	20.0	95	61 - 132
Acetone	17.6	20.0	88	64 - 133
Benzene	20.0	20.0	100	78 - 118
Bromodichloromethane	21.1	20.0	106	79 - 123
Bromoform	22.3	20.0	111	69 - 126
Bromomethane	18.3	20.0	91	49 - 124
Carbon Disulfide	20.2	20.0	101	67 - 138
Carbon Tetrachloride	21.3	20.0	107	64 - 129
Chlorobenzene	19.8	20.0	99	80 - 121
Chloroethane	18.2	20.0	91	72 - 130
Chloroform	19.7	20.0	99	75 - 123
Chloromethane	17.0	20.0	85	55 - 139
Cyclohexane	16.7	20.0	83	55 - 132
Dibromochloromethane	22.0	20.0	110	78 - 127
Dichlorodifluoromethane (CFC 12)	18.0	20.0	90	45 - 147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Analyzed: 9/17/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 309756

**Lab Control Sample
 RQ1210869-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	19.5	20.0	97	73 - 122
Ethylbenzene	19.2	20.0	96	75 - 123
Isopropylbenzene (Cumene)	20.3	20.0	101	75 - 139
Methyl Acetate	20.0	20.0	100	65 - 131
Methyl tert-Butyl Ether	21.0	20.0	105	75 - 116
Methylcyclohexane	16.9	20.0	85	59 - 127
Styrene	19.4	20.0	97	80 - 121
Tetrachloroethene (PCE)	19.2	20.0	96	71 - 127
Toluene	20.1	20.0	100	77 - 120
Trichloroethene (TCE)	19.7	20.0	98	75 - 122
Trichlorofluoromethane (CFC 11)	21.2	20.0	106	64 - 134
Vinyl Chloride	18.4	20.0	92	68 - 139
cis-1,2-Dichloroethene	19.9	20.0	100	77 - 123
cis-1,3-Dichloropropene	19.2	20.0	96	77 - 125
m,p-Xylenes	39.4	40.0	98	77 - 124
n-Butyl Acetate	18.8	20.0	94	61 - 126
o-Xylene	19.6	20.0	98	77 - 131
trans-1,2-Dichloroethene	19.2	20.0	96	72 - 120
trans-1,3-Dichloropropene	19.8	20.0	99	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 FO0552B
Sample Matrix: Water

Service Request: R1206035
Date Analyzed: 9/18/12

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 310015

**Lab Control Sample
RQ1210947-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	30.4	26.0	117	82 - 127
Ethene	26.4	24.3	109	76 - 119
Methane	30.7	26.2	117	82 - 126

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services


1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: *[Signature]*

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C plus n-butyl acetate)	TOC (9060A)	MEEs (RSK 175)	REMARKS
LC34-BW0002A-024.5-201209-11	9/11/12	907	-001	W	9	3	3	3	
LC34-BW0002B-031.5-201209-11		943	-002	W	9	3	3	3	
LC34-BW0002C-038.5-201209-11		1013	-003	W	9	3	3	3	
LC34-BW0002D-045.5-201209-11		1151	-004	W	9	3	3	3	
LC34-BW0002E-052.5-201209-11		1122	-005	W	9	3	3	3	
LC34-BW0002F-059.5-201209-11		1046	-006	W	9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA KEDD

Comments/Special Instructions:

R1206035
 Geosyntec Consultants
 ESTCP PED LC34 FO0662B
5

RELINQUISHED BY:
 Signature: *[Signature]*
 Printed Name: Carol Garner
 Firm: Geosyntec
 Date/Time: 9/11/12 1700

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: FJD
 Firm: _____
 Date/Time: 9/11/12

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: *[Signature]*
 Printed Name: Gregory O. Somerjian
 Firm: ARB
 Date/Time: 9/13/12 9:50

Columbia Analytical Services


1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-5475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Dapratto Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Tusculum, TN 37780 FAX: 321-269-5813
 Sampler's Signature: [Signature]

Sample ID	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	TOC (9060A)	MEEs (RSK 175)	REMARKS
LC34-BW0003A-024.5-201209	9/11/12	1318	007	W	9	3	3	3	
LC34-BW0003B-031.5-201209	9/11/12	1342	008	W	9	3	3	3	
LC34-BW6666C-038.5-201209				W	9	3	3	3	
LC34-BW0003D-045.5-201209				W	9	3	3	3	
LC34-BW0003E-052.5-201209				W	9	3	3	3	
LC34-BW0003F-059.5-201209				W	9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 X Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: X
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 X EDD?: NASA, KEDD

Comments/Special Instructions:
R1206035
 Geosyntec Consultants
 ESTCP PED LC34 FO0552B

5

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: David Semore
 Firm: Geosyntec
 Date/Time: 9/11/12 1300

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Fred [unclear]
 Firm: [unclear]
 Date/Time: 9/11/12 1700

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: Gregory O'Smerian
 Firm: ALB
 Date/Time: 9-12-12 9:50

RECEIVED BY:
 Signature: [Signature]
 Printed Name: Gregory O'Smerian
 Firm: ALB
 Date/Time: 9-12-12 9:50



Cooler Receipt and Preservation Check Form

Project/Client _____ Folder Number R1206035

Cooler received on 9-12-12 by: ME COURIER: ALS UPS FEDEX VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? ALS/ROC CLIENT
7. Temperature of cooler(s) upon receipt: 4.5°

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No

Date/Time Temperatures Taken: 9-12-12 @ 10:08

Thermometer ID: IR GUN#3 IR GUN#4 .Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location R-602 by ME on 9-12-12 at 10:10
 5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: 9/12/12

Cooler Breakdown: Date: 9/12/12 Time: 1500 by: ME

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	Lot Received **		Exp	Sample ID	Vol. Added	Lot Added	Final pH	Yes = All samples OK No = Samples were preserved at lab as listed PM OK to Adjust: _____
		YES	NO						
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄								
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522								
	Na ₂ S ₂ O ₃	-	-						*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet
	Zn Aceta	-	-						
	HCl	*	*	<u>4/11/10</u>	<u>7/13</u>				

Bottle lot numbers: 2-143-001, 2-143-002
 Other Comments: _____

PC Secondary Review: KE 9/27/12
 H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm ; WC -1 in. diameter



October 01, 2012

Service Request No: R1206126

Dr. Rebecca Daprato
GeoSyntec Consultants
11490 Westheimer
Suite 150
Houston, TX 77077

Laboratory Results for: ESTCP PED LC34 9/13/12

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on September 14, 2012. For your reference, these analyses have been assigned our service request number **R1206126**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

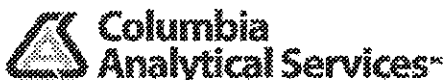
Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

A handwritten signature in cursive script that reads "Karen Bunker".

Karen Bunker
Project Manager

Page 1 of 94



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

#ALS

www.caslab.com - www.alsglobal.com

RIGHT SOLUTIONS. RIGHT PARTNERS.

00001

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ FO552B (9/13/12)
Sample Matrix: Water

Service Request No.: R1206126
Date Received: 9/14/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Sixteen (16) water samples were collected by the client on 9/13/12 and were received for analysis at Columbia Analytical Services on 9/14/12 via a national courier. The samples were received at a cooler temperature range of 5.8-5.9°C within the guidelines of 0-6°C. The chain of custody forms were consistent with the samples received. Some bubbles were noted in vials on the Cooler Receipt and Preservation Form.

Volatile Organic Compounds GC/MS

Sixteen (16) water samples were analyzed for a client specific list of Volatile Organics by GC/MS Method 8260C and Dissolved Gases by GC method RSK-175.

The minimum response factor for Acetone was not met in the ICV from 9/17/12 and Trichloroethene on the 9/18/12 run. The data has been considered acceptable since the MRL's have been verified by the low standard in the calibration.

The Continuing Calibration Verification (CCV) %D for 1,2,4-Trichlorobenzene was outside the 20% limit on the 9/17/12 run and Dichlorodifluoromethane on the 9/18/12 run. Any hits for these compounds on the associated runs should be considered as estimated, however the samples were non-detect for this compound and therefore unaffected.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicate (LCSD) recoveries were all within QC limits except for Methyl Tert-Butyl Ether (LCS only) on the 9/18/12 8260C run. The recovery has been flagged as "*".

The samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

All Volatile Organic samples were analyzed within 7 days from collection, the holding time for unpreserved vials, which are required for this project. All vials are checked after analysis to verify the pH in order to maintain the integrity of the sample.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

The primary and secondary standards expired on 8/31/12 for the RSK-175 analysis. New standards had been ordered well before the expiration dates, however, they did not arrive until 9/25/12. All samples were analyzed within the proper holding time for the analysis, prior to the receipt of the new standards. Gas standards have a 1 year expiration date as per the vendor. No significant degradation was noted over the year. All CCV's, LCS's, MS and MSD recoveries were acceptable. The data has been reported.

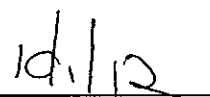
The Laboratory Method Blanks were free from contamination.

No other analytical or QC problems were encountered.

Approved by



Date



Inorganic Parameters

Sixteen (16) samples were analyzed for TOC by method 9060A. The average of 4 runs are reported for each sample.

All Initial and Continuing Calibration criteria was met.

Batch QC is included in the report. All Laboratory Control Sample (LCS) recoveries were acceptable.

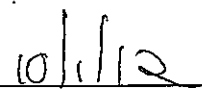
The samples were run within holding time.

No problems were encountered during the analysis of these samples.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1206126

<u>Lab ID</u>	<u>Client ID</u>
R1206126-001	LC34-BW0001A-024.5-20120913
R1206126-002	LC34-BW0001B-031.5-20120913
R1206126-003	LC34-BW0001C-038.5-20120913
R1206126-004	LC34-BW0001D-045.5-20120913
R1206126-005	LC34-BW0001E-052.5-20120913
R1206126-006	LC34-BW0001F-059.5-20120913
R1206126-007	LC34-BW0003C-038.5-20120913
R1206126-008	LC34-BW0003D-045.5-20120913
R1206126-009	LC34-BW0003E-052.5-20120913
R1206126-010	LC34-BW0003F-059.5-20120913
R1206126-011	LC34-RW0007-038.5-20120913
R1206126-012	LC34-RW0008-052.0-20120913
R1206126-013	LC34-IW0002I-027.5-20120913
R1206126-014	LC34-IW0002D-037.5-20120913
R1206126-015	LC34-IW0002DI-052.5-20120913
R1206126-016	LC34-IW0076-075.0-20120913

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120913
Lab Code: R1206126-001

Service Request: R1206126
Date Collected: 9/13/12 1055
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.3		mg/L	1.0	1	NA	9/22/12 12:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120913
Lab Code: R1206126-001

Service Request: R1206126
Date Collected: 9/13/12 1055
Date Received: 9/14/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	500	U	500	36	100	NA	9/18/12 11:31		309911	
1,1,2,2-Tetrachloroethane	500	U	500	25	100	NA	9/18/12 11:31		309911	
1,1,2-Trichloroethane	500	U	500	34	100	NA	9/18/12 11:31		309911	
1,1,2-Trichloro-1,2,2-trifluoroethane	20000		2500	160	500	NA	9/17/12 13:17		309687	
1,1-Dichloroethane (1,1-DCA)	500	U	500	20	100	NA	9/18/12 11:31		309911	
1,1-Dichloroethene (1,1-DCE)	500	U	500	57	100	NA	9/18/12 11:31		309911	
1,2,4-Trichlorobenzene	500	U	500	23	100	NA	9/18/12 11:31		309911	
1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	74	100	NA	9/18/12 11:31		309911	
1,2-Dibromoethane	500	U	500	24	100	NA	9/18/12 11:31		309911	
1,2-Dichlorobenzene	500	U	500	21	100	NA	9/18/12 11:31		309911	
1,2-Dichloroethane	500	U	500	36	100	NA	9/18/12 11:31		309911	
1,2-Dichloropropane	500	U	500	20	100	NA	9/18/12 11:31		309911	
1,3-Dichlorobenzene	500	U	500	20	100	NA	9/18/12 11:31		309911	
1,4-Dichlorobenzene	500	U	500	20	100	NA	9/18/12 11:31		309911	
n-Butanol	25000	U	25000	1800	100	NA	9/18/12 11:31		309911	
2-Butanone (MEK)	1000	U	1000	81	100	NA	9/18/12 11:31		309911	
2-Hexanone	1000	U	1000	170	100	NA	9/18/12 11:31		309911	
4-Methyl-2-pentanone	1000	U	1000	67	100	NA	9/18/12 11:31		309911	
Acetone	1000	U	1000	130	100	NA	9/18/12 11:31		309911	
Benzene	500	U	500	20	100	NA	9/18/12 11:31		309911	
Bromodichloromethane	500	U	500	32	100	NA	9/18/12 11:31		309911	
Bromoform	500	U	500	42	100	NA	9/18/12 11:31		309911	
Bromomethane	500	U	500	29	100	NA	9/18/12 11:31		309911	
Carbon Disulfide	1000	U	1000	22	100	NA	9/18/12 11:31		309911	
Carbon Tetrachloride	500	U	500	45	100	NA	9/18/12 11:31		309911	
Chlorobenzene	500	U	500	29	100	NA	9/18/12 11:31		309911	
Chloroethane	500	U	500	24	100	NA	9/18/12 11:31		309911	
Chloroform	500	U	500	25	100	NA	9/18/12 11:31		309911	
Chloromethane	500	U	500	21	100	NA	9/18/12 11:31		309911	
Cyclohexane	1000	U	1000	25	100	NA	9/18/12 11:31		309911	
Dibromochloromethane	500	U	500	31	100	NA	9/18/12 11:31		309911	
Dichlorodifluoromethane (CFC 12)	500	U	500	46	100	NA	9/18/12 11:31		309911	
Dichloromethane	500	U	500	32	100	NA	9/18/12 11:31		309911	
Ethylbenzene	500	U	500	20	100	NA	9/18/12 11:31		309911	
Isopropylbenzene (Cumene)	500	U	500	20	100	NA	9/18/12 11:31		309911	
Methyl Acetate	1000	U	1000	43	100	NA	9/18/12 11:31		309911	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001A-024.5-20120913
Lab Code: R1206126-001

Service Request: R1206126
Date Collected: 9/13/12 1055
Date Received: 9/14/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	500	U	500	29	100	NA	9/18/12 11:31		309911	
Methylcyclohexane	1000	U	1000	27	100	NA	9/18/12 11:31		309911	
Styrene	500	U	500	20	100	NA	9/18/12 11:31		309911	
Tetrachloroethene (PCE)	500	U	500	30	100	NA	9/18/12 11:31		309911	
Toluene	500	U	500	20	100	NA	9/18/12 11:31		309911	
Trichloroethene (TCE)	500	U	500	22	100	NA	9/18/12 11:31		309911	
Trichlorofluoromethane (CFC 11)	500	U	500	20	100	NA	9/18/12 11:31		309911	
Vinyl Chloride	200	I	500	32	100	NA	9/18/12 11:31		309911	
cis-1,2-Dichloroethene	1700		500	30	100	NA	9/18/12 11:31		309911	
cis-1,3-Dichloropropene	500	U	500	24	100	NA	9/18/12 11:31		309911	
m,p-Xylenes	500	U	500	33	100	NA	9/18/12 11:31		309911	
n-Butyl Acetate	500	U	500	39	100	NA	9/18/12 11:31		309911	
o-Xylene	500	U	500	20	100	NA	9/18/12 11:31		309911	
trans-1,2-Dichloroethene	60	I	500	33	100	NA	9/18/12 11:31		309911	
trans-1,3-Dichloropropene	500	U	500	20	100	NA	9/18/12 11:31		309911	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	9/18/12 11:31	
Dibromofluoromethane	99	89-119	9/18/12 11:31	
Toluene-d8	101	87-121	9/18/12 11:31	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1055
Date Received: 9/14/12
Date Analyzed: 9/19/12 13:51

Sample Name: LC34-BW0001A-024,5-20120913
Lab Code: R1206126-001

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star723.run

Analysis Lot: 310243
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.2		1.0	
74-85-1	Ethene	12		1.0	
74-82-8	Methane	46		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1123
Date Received: 9/14/12

Sample Name: LC34-BW0001B-031.5-20120913
Lab Code: R1206126-002

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	3.4		mg/L	1.0	1	NA	9/22/12 14:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20120913
Lab Code: R1206126-002

Service Request: R1206126
Date Collected: 9/13/12 1123
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	90	250	NA	9/17/12 13:59		309687	
1,1,2,2-Tetrachloroethane	1300	U	1300	63	250	NA	9/17/12 13:59		309687	
1,1,2-Trichloroethane	1300	U	1300	85	250	NA	9/17/12 13:59		309687	
1,1,2-Trichloro-1,2,2-trifluoroethane	98000		5000	310	1000	NA	9/19/12 02:34		309913	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	150	250	NA	9/17/12 13:59		309687	
1,2,4-Trichlorobenzene	1300	U	1300	58	250	NA	9/17/12 13:59		309687	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	190	250	NA	9/17/12 13:59		309687	
1,2-Dibromoethane	1300	U	1300	60	250	NA	9/17/12 13:59		309687	
1,2-Dichlorobenzene	1300	U	1300	53	250	NA	9/17/12 13:59		309687	
1,2-Dichloroethane	1300	U	1300	90	250	NA	9/17/12 13:59		309687	
1,2-Dichloropropane	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
n-Butanol	63000	U	63000	4400	250	NA	9/17/12 13:59		309687	
2-Butanone (MEK)	2500	U	2500	210	250	NA	9/17/12 13:59		309687	
2-Hexanone	2500	U	2500	420	250	NA	9/17/12 13:59		309687	
4-Methyl-2-pentanone	2500	U	2500	170	250	NA	9/17/12 13:59		309687	
Acetone	2500	U	2500	310	250	NA	9/17/12 13:59		309687	
Benzene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Bromodichloromethane	1300	U	1300	80	250	NA	9/17/12 13:59		309687	
Bromoform	1300	U	1300	110	250	NA	9/17/12 13:59		309687	
Bromomethane	1300	U	1300	73	250	NA	9/17/12 13:59		309687	
Carbon Disulfide	2500	U	2500	55	250	NA	9/17/12 13:59		309687	
Carbon Tetrachloride	1300	U	1300	120	250	NA	9/17/12 13:59		309687	
Chlorobenzene	1300	U	1300	73	250	NA	9/17/12 13:59		309687	
Chloroethane	1300	U	1300	60	250	NA	9/17/12 13:59		309687	
Chloroform	1300	U	1300	63	250	NA	9/17/12 13:59		309687	
Chloromethane	1300	U	1300	53	250	NA	9/17/12 13:59		309687	
Cyclohexane	2500	U	2500	63	250	NA	9/17/12 13:59		309687	
Dibromochloromethane	1300	U	1300	78	250	NA	9/17/12 13:59		309687	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	120	250	NA	9/17/12 13:59		309687	
Dichloromethane	1300	U	1300	80	250	NA	9/17/12 13:59		309687	
Ethylbenzene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Methyl Acetate	2500	U	2500	110	250	NA	9/17/12 13:59		309687	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001B-031.5-20120913
Lab Code: RI206126-002

Service Request: RI206126
Date Collected: 9/13/12 1123
Date Received: 9/14/12
Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	1300	U	1300	73	250	NA	9/17/12 13:59		309687	
Methylcyclohexane	2500	U	2500	68	250	NA	9/17/12 13:59		309687	
Styrene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Tetrachloroethene (PCE)	1300	U	1300	75	250	NA	9/17/12 13:59		309687	
Toluene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Trichloroethene (TCE)	350	I	1300	55	250	NA	9/17/12 13:59		309687	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
Vinyl Chloride	1100	I	1300	80	250	NA	9/17/12 13:59		309687	
cis-1,2-Dichloroethene	19000		1300	75	250	NA	9/17/12 13:59		309687	
cis-1,3-Dichloropropene	1300	U	1300	60	250	NA	9/17/12 13:59		309687	
m,p-Xylenes	1300	U	1300	83	250	NA	9/17/12 13:59		309687	
n-Butyl Acetate	1300	U	1300	98	250	NA	9/17/12 13:59		309687	
o-Xylene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	
trans-1,2-Dichloroethene	510	I	1300	83	250	NA	9/17/12 13:59		309687	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	9/17/12 13:59		309687	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	9/17/12 13:59	
Dibromofluoromethane	100	89-119	9/17/12 13:59	
Toluene-d8	106	87-121	9/17/12 13:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1123
Date Received: 9/14/12
Date Analyzed: 9/19/12 14:02

Sample Name: LC34-BW0001B-031.5-20120913
Lab Code: R1206126-002

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star724.run

Analysis Lot: 310243
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	6.3		1.0	
74-85-1	Ethene	31		1.0	
74-82-8	Methane	71		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120913
Lab Code: R1206126-003

Service Request: R1206126
Date Collected: 9/13/12 1127
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	10.4		mg/L	1.0	1	NA	9/24/12 20:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120913
Lab Code: R1206126-003

Service Request: R1206126
Date Collected: 9/13/12 1127
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1300	U	1300	90	250	NA	9/17/12 14:27		309687	
1,1,2,2-Tetrachloroethane	1300	U	1300	63	250	NA	9/17/12 14:27		309687	
1,1,2-Trichloroethane	1300	U	1300	85	250	NA	9/17/12 14:27		309687	
1,1,2-Trichloro-1,2,2-trifluoroethane	47000		1300	78	250	NA	9/17/12 14:27		309687	
1,1-Dichloroethane (1,1-DCA)	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
1,1-Dichloroethene (1,1-DCE)	1300	U	1300	150	250	NA	9/17/12 14:27		309687	
1,2,4-Trichlorobenzene	1300	U	1300	58	250	NA	9/17/12 14:27		309687	
1,2-Dibromo-3-chloropropane (DBCP)	1300	U	1300	190	250	NA	9/17/12 14:27		309687	
1,2-Dibromoethane	1300	U	1300	60	250	NA	9/17/12 14:27		309687	
1,2-Dichlorobenzene	1300	U	1300	53	250	NA	9/17/12 14:27		309687	
1,2-Dichloroethane	1300	U	1300	90	250	NA	9/17/12 14:27		309687	
1,2-Dichloropropane	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
1,3-Dichlorobenzene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
1,4-Dichlorobenzene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
n-Butanol	63000	U	63000	4400	250	NA	9/17/12 14:27		309687	
2-Butanone (MEK)	2500	U	2500	210	250	NA	9/17/12 14:27		309687	
2-Hexanone	2500	U	2500	420	250	NA	9/17/12 14:27		309687	
4-Methyl-2-pentanone	2500	U	2500	170	250	NA	9/17/12 14:27		309687	
Acetone	2500	U	2500	310	250	NA	9/17/12 14:27		309687	
Benzene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Bromodichloromethane	1300	U	1300	80	250	NA	9/17/12 14:27		309687	
Bromoform	1300	U	1300	110	250	NA	9/17/12 14:27		309687	
Bromomethane	1300	U	1300	73	250	NA	9/17/12 14:27		309687	
Carbon Disulfide	2500	U	2500	55	250	NA	9/17/12 14:27		309687	
Carbon Tetrachloride	1300	U	1300	120	250	NA	9/17/12 14:27		309687	
Chlorobenzene	1300	U	1300	73	250	NA	9/17/12 14:27		309687	
Chloroethane	1300	U	1300	60	250	NA	9/17/12 14:27		309687	
Chloroform	300	I	1300	63	250	NA	9/17/12 14:27		309687	
Chloromethane	1300	U	1300	53	250	NA	9/17/12 14:27		309687	
Cyclohexane	2500	U	2500	63	250	NA	9/17/12 14:27		309687	
Dibromochloromethane	1300	U	1300	78	250	NA	9/17/12 14:27		309687	
Dichlorodifluoromethane (CFC 12)	1300	U	1300	120	250	NA	9/17/12 14:27		309687	
Dichloromethane	1300	U	1300	80	250	NA	9/17/12 14:27		309687	
Ethylbenzene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Isopropylbenzene (Cumene)	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Methyl Acetate	2500	U	2500	110	250	NA	9/17/12 14:27		309687	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001C-038.5-20120913
Lab Code: R1206126-003

Service Request: R1206126
Date Collected: 9/13/12 1127
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
Methyl tert-Butyl Ether	1300	U	1300	73	250	NA	9/17/12 14:27		309687	
Methylcyclohexane	2500	U	2500	68	250	NA	9/17/12 14:27		309687	
Styrene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Tetrachloroethene (PCE)	1300	U	1300	75	250	NA	9/17/12 14:27		309687	
Toluene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Trichloroethene (TCE)	130	I	1300	55	250	NA	9/17/12 14:27		309687	
Trichlorofluoromethane (CFC 11)	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
Vinyl Chloride	1900		1300	80	250	NA	9/17/12 14:27		309687	
cis-1,2-Dichloroethene	20000		1300	75	250	NA	9/17/12 14:27		309687	
cis-1,3-Dichloropropene	1300	U	1300	60	250	NA	9/17/12 14:27		309687	
m,p-Xylenes	1300	U	1300	83	250	NA	9/17/12 14:27		309687	
n-Butyl Acetate	1300	U	1300	98	250	NA	9/17/12 14:27		309687	
o-Xylene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	
trans-1,2-Dichloroethene	420	I	1300	83	250	NA	9/17/12 14:27		309687	
trans-1,3-Dichloropropene	1300	U	1300	50	250	NA	9/17/12 14:27		309687	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	9/17/12 14:27	
Dibromofluoromethane	96	89-119	9/17/12 14:27	
Toluene-d8	103	87-121	9/17/12 14:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1127
Date Received: 9/14/12
Date Analyzed: 9/19/12 13:17

Sample Name: LC34-BW0001C-038.5-20120913
Lab Code: R1206126-003

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star720.run

Analysis Lot: 310243
Instrument Name: R-GC-02
Dilution Factor: 4

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	23		4.0	
74-85-1	Ethene	200		4.0	
74-82-8	Methane	180		4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001D-045.5-20120913
Lab Code: R1206126-004

Service Request: R1206126
Date Collected: 9/13/12 1213
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	92		mg/L	10	10	NA	9/22/12 16:09	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1213
Date Received: 9/14/12
Date Analyzed: 9/18/12 12:32

Sample Name: LC34-BW0001D-045.5-20120913
Lab Code: R1206126-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9421.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 500

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	2500	U	2500	180	
79-34-5	1,1,2,2-Tetrachloroethane	2500	U	2500	130	
79-00-5	1,1,2-Trichloroethane	2500	U	2500	170	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	83000		2500	160	
75-34-3	1,1-Dichloroethane (1,1-DCA)	2500	U	2500	100	
75-35-4	1,1-Dichloroethene (1,1-DCE)	2500	U	2500	290	
120-82-1	1,2,4-Trichlorobenzene	2500	U	2500	120	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	2500	U	2500	370	
106-93-4	1,2-Dibromoethane	2500	U	2500	120	
95-50-1	1,2-Dichlorobenzene	2500	U	2500	110	
107-06-2	1,2-Dichloroethane	2500	U	2500	180	
78-87-5	1,2-Dichloropropane	2500	U	2500	100	
541-73-1	1,3-Dichlorobenzene	2500	U	2500	100	
106-46-7	1,4-Dichlorobenzene	2500	U	2500	100	
71-36-3	n-Butanol	130000	U	130000	8700	
78-93-3	2-Butanone (MEK)	5000	U	5000	410	
591-78-6	2-Hexanone	5000	U	5000	830	
108-10-1	4-Methyl-2-pentanone	5000	U	5000	340	
67-64-1	Acetone	5000	U	5000	620	
71-43-2	Benzene	2500	U	2500	100	
75-27-4	Bromodichloromethane	2500	U	2500	160	
75-25-2	Bromoform	2500	U	2500	210	
74-83-9	Bromomethane	2500	U	2500	150	
75-15-0	Carbon Disulfide	5000	U	5000	110	
56-23-5	Carbon Tetrachloride	2500	U	2500	230	
108-90-7	Chlorobenzene	2500	U	2500	150	
75-00-3	Chloroethane	2500	U	2500	120	
67-66-3	Chloroform	370	I	2500	130	
74-87-3	Chloromethane	2500	U	2500	110	
110-82-7	Cyclohexane	5000	U	5000	130	
124-48-1	Dibromochloromethane	2500	U	2500	160	
75-71-8	Dichlorodifluoromethane (CFC 12)	2500	U	2500	230	
75-09-2	Dichloromethane	2500	U	2500	160	
100-41-4	Ethylbenzene	2500	U	2500	100	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1213
Date Received: 9/14/12
Date Analyzed: 9/18/12 12:32

Sample Name: LC34-BW0001D-045.5-20120913
Lab Code: R1206126-004

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9421.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 500

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	2500 U	2500	100	
79-20-9	Methyl Acetate	5000 U	5000	220	
1634-04-4	Methyl tert-Butyl Ether	2500 U	2500	150	
108-87-2	Methylcyclohexane	5000 U	5000	140	
100-42-5	Styrene	2500 U	2500	100	
127-18-4	Tetrachloroethene (PCE)	2500 U	2500	150	
108-88-3	Toluene	2500 U	2500	100	
79-01-6	Trichloroethene (TCE)	43000	2500	110	
75-69-4	Trichlorofluoromethane (CFC 11)	2500 U	2500	100	
75-01-4	Vinyl Chloride	990 I	2500	160	
156-59-2	cis-1,2-Dichloroethene	12000	2500	150	
10061-01-5	cis-1,3-Dichloropropene	2500 U	2500	120	
179601-23-1	m,p-Xylenes	2500 U	2500	170	
123-86-4	n-Butyl Acetate	2500 U	2500	200	
95-47-6	o-Xylene	2500 U	2500	100	
156-60-5	trans-1,2-Dichloroethene	2500 U	2500	170	
10061-02-6	trans-1,3-Dichloropropene	2500 U	2500	100	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	9/18/12 12:32	
Dibromofluoromethane	97	89-119	9/18/12 12:32	
Toluene-d8	100	87-121	9/18/12 12:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1213
Date Received: 9/14/12
Date Analyzed: 9/19/12 14:13

Sample Name: LC34-BW0001D-045.5-20120913
Lab Code: R1206126-004

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star725.run

Analysis Lot: 310243
Instrument Name: R-GC-02
Dilution Factor: 2

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	93		2.0	
74-85-1	Ethene	43		2.0	
74-82-8	Methane	160		2.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120913
Lab Code: R1206126-005

Service Request: R1206126
Date Collected: 9/13/12 1153
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	9.0		mg/L	2.0	2	NA	9/22/12 16:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120913
Lab Code: R1206126-005

Service Request: R1206126
Date Collected: 9/13/12 1153
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	13	U	13	0.90	2.5	NA	9/18/12 13:00		309911	
1,1,2,2-Tetrachloroethane	13	U	13	0.63	2.5	NA	9/18/12 13:00		309911	
1,1,2-Trichloroethane	13	U	13	0.86	2.5	NA	9/18/12 13:00		309911	
1,1,2-Trichloro-1,2,2-trifluoroethane	460		50	3.1	10	NA	9/17/12 15:27		309687	
1,1-Dichloroethane (1,1-DCA)	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
1,1-Dichloroethene (1,1-DCE)	13	U	13	1.5	2.5	NA	9/18/12 13:00		309911	
1,2,4-Trichlorobenzene	13	U	13	0.58	2.5	NA	9/18/12 13:00		309911	
1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.9	2.5	NA	9/18/12 13:00		309911	
1,2-Dibromoethane	13	U	13	0.60	2.5	NA	9/18/12 13:00		309911	
1,2-Dichlorobenzene	13	U	13	0.53	2.5	NA	9/18/12 13:00		309911	
1,2-Dichloroethane	13	U	13	0.90	2.5	NA	9/18/12 13:00		309911	
1,2-Dichloropropane	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
1,3-Dichlorobenzene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
1,4-Dichlorobenzene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
n-Butanol	630	U	630	44	2.5	NA	9/18/12 13:00		309911	
2-Butanone (MEK)	25	U	25	2.1	2.5	NA	9/18/12 13:00		309911	
2-Hexanone	25	U	25	4.2	2.5	NA	9/18/12 13:00		309911	
4-Methyl-2-pentanone	25	U	25	1.7	2.5	NA	9/18/12 13:00		309911	
Acetone	4.5	I	25	3.1	2.5	NA	9/18/12 13:00		309911	
Benzene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Bromodichloromethane	13	U	13	0.80	2.5	NA	9/18/12 13:00		309911	
Bromoform	13	U	13	1.1	2.5	NA	9/18/12 13:00		309911	
Bromomethane	13	U	13	0.73	2.5	NA	9/18/12 13:00		309911	
Carbon Disulfide	9.4	I	25	0.55	2.5	NA	9/18/12 13:00		309911	
Carbon Tetrachloride	13	U	13	1.2	2.5	NA	9/18/12 13:00		309911	
Chlorobenzene	13	U	13	0.73	2.5	NA	9/18/12 13:00		309911	
Chloroethane	13	U	13	0.60	2.5	NA	9/18/12 13:00		309911	
Chloroform	13	U	13	0.63	2.5	NA	9/18/12 13:00		309911	
Chloromethane	13	U	13	0.53	2.5	NA	9/18/12 13:00		309911	
Cyclohexane	25	U	25	0.63	2.5	NA	9/18/12 13:00		309911	
Dibromochloromethane	13	U	13	0.78	2.5	NA	9/18/12 13:00		309911	
Dichlorodifluoromethane (CFC 12)	13	U	13	1.2	2.5	NA	9/18/12 13:00		309911	
Dichloromethane	0.98	I	13	0.80	2.5	NA	9/18/12 13:00		309911	
Ethylbenzene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Isopropylbenzene (Cumene)	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Methyl Acetate	25	U	25	1.1	2.5	NA	9/18/12 13:00		309911	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120913
Lab Code: R1206126-005

Service Request: R1206126
Date Collected: 9/13/12 1153
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	13	U	13	0.73	2.5	NA	9/18/12 13:00		309911	
Methylcyclohexane	25	U	25	0.68	2.5	NA	9/18/12 13:00		309911	
Styrene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Tetrachloroethene (PCE)	13	U	13	0.75	2.5	NA	9/18/12 13:00		309911	
Toluene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Trichloroethene (TCE)	2.4	I	13	0.55	2.5	NA	9/18/12 13:00		309911	
Trichlorofluoromethane (CFC 11)	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
Vinyl Chloride	23		13	0.80	2.5	NA	9/18/12 13:00		309911	
cis-1,2-Dichloroethene	13		13	0.75	2.5	NA	9/18/12 13:00		309911	
cis-1,3-Dichloropropene	13	U	13	0.60	2.5	NA	9/18/12 13:00		309911	
m,p-Xylenes	13	U	13	0.83	2.5	NA	9/18/12 13:00		309911	
n-Butyl Acetate	13	U	13	0.98	2.5	NA	9/18/12 13:00		309911	
o-Xylene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	
trans-1,2-Dichloroethene	2.5	I	13	0.83	2.5	NA	9/18/12 13:00		309911	
trans-1,3-Dichloropropene	13	U	13	0.50	2.5	NA	9/18/12 13:00		309911	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	9/18/12 13:00	
Dibromofluoromethane	98	89-119	9/18/12 13:00	
Toluene-d8	100	87-121	9/18/12 13:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001E-052.5-20120913
Lab Code: R1206126-005

Service Request: R1206126
Date Collected: 9/13/12 1153
Date Received: 9/14/12

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	25	U	25	25	NA	9/20/12 10:27		310244	
Ethene	390		25	25	NA	9/20/12 10:27		310244	
Methane	2700		50	50	NA	9/20/12 10:37		310244	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0001F-059.5-20120913
Lab Code: R1206126-006

Service Request: R1206126
Date Collected: 9/13/12 1151
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	3.5		mg/L	1.0	1	NA	9/22/12 17:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1151
Date Received: 9/14/12
Date Analyzed: 9/17/12 15:55

Sample Name: LC34-BW0001F-059.5-20120913
Lab Code: R1206126-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9396.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.71 I	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	1.5 I	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	0.30 I	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1151
Date Received: 9/14/12
Date Analyzed: 9/17/12 15:55

Sample Name: LC34-BW0001F-059.5-20120913
Lab Code: R1206126-006

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9396.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	1.4	I	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	3.8	I	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	0.50	I	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	0.40	I	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	108	85-122	9/17/12 15:55	
Dibromofluoromethane	101	89-119	9/17/12 15:55	
Toluene-d8	108	87-121	9/17/12 15:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1151
Date Received: 9/14/12
Date Analyzed: 9/20/12 10:50

Sample Name: LC34-BW0001F-059.5-20120913
Lab Code: R1206126-006

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star733.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	5.0 U	5.0	
74-85-1	Ethene	99	5.0	
74-82-8	Methane	300	5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0003C-038.5-20120913
Lab Code: R1206126-007

Service Request: R1206126
Date Collected: 9/13/12 0835
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	3.2		mg/L	1.0	1	NA	9/22/12 19:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0835
Date Received: 9/14/12
Date Analyzed: 9/18/12 13:32

Sample Name: LC34-BW0003C-038.5-20120913
Lab Code: R1206126-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9423.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	500	U	500	36	
79-34-5	1,1,2,2-Tetrachloroethane	500	U	500	25	
79-00-5	1,1,2-Trichloroethane	500	U	500	34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	500	U	500	31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	500	U	500	20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	500	U	500	57	
120-82-1	1,2,4-Trichlorobenzene	500	U	500	23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	500	U	500	74	
106-93-4	1,2-Dibromoethane	500	U	500	24	
95-50-1	1,2-Dichlorobenzene	500	U	500	21	
107-06-2	1,2-Dichloroethane	500	U	500	36	
78-87-5	1,2-Dichloropropane	500	U	500	20	
541-73-1	1,3-Dichlorobenzene	500	U	500	20	
106-46-7	1,4-Dichlorobenzene	500	U	500	20	
71-36-3	n-Butanol	25000	U	25000	1800	
78-93-3	2-Butanone (MEK)	1000	U	1000	81	
591-78-6	2-Hexanone	1000	U	1000	170	
108-10-1	4-Methyl-2-pentanone	1000	U	1000	67	
67-64-1	Acetone	1000	U	1000	130	
71-43-2	Benzene	500	U	500	20	
75-27-4	Bromodichloromethane	500	U	500	32	
75-25-2	Bromoform	500	U	500	42	
74-83-9	Bromomethane	500	U	500	29	
75-15-0	Carbon Disulfide	43	I	1000	22	
56-23-5	Carbon Tetrachloride	500	U	500	45	
108-90-7	Chlorobenzene	500	U	500	29	
75-00-3	Chloroethane	500	U	500	24	
67-66-3	Chloroform	36	I	500	25	
74-87-3	Chloromethane	500	U	500	21	
110-82-7	Cyclohexane	1000	U	1000	25	
124-48-1	Dibromochloromethane	500	U	500	31	
75-71-8	Dichlorodifluoromethane (CFC 12)	500	U	500	46	
75-09-2	Dichloromethane	500	U	500	32	
100-41-4	Ethylbenzene	500	U	500	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0835
Date Received: 9/14/12
Date Analyzed: 9/18/12 13:32

Sample Name: LC34-BW0003C-038.5-20120913
Lab Code: R1206126-007

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9423.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 100

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	500	U	500	20	
79-20-9	Methyl Acetate	1000	U	1000	43	
1634-04-4	Methyl tert-Butyl Ether	500	U	500	29	
108-87-2	Methylcyclohexane	1000	U	1000	27	
100-42-5	Styrene	500	U	500	20	
127-18-4	Tetrachloroethene (PCE)	500	U	500	30	
108-88-3	Toluene	500	U	500	20	
79-01-6	Trichloroethene (TCE)	500	U	500	22	
75-69-4	Trichlorofluoromethane (CFC 11)	500	U	500	20	
75-01-4	Vinyl Chloride	5100		500	32	
156-59-2	cis-1,2-Dichloroethene	17000		500	30	
10061-01-5	cis-1,3-Dichloropropene	500	U	500	24	
179601-23-1	m,p-Xylenes	500	U	500	33	
123-86-4	n-Butyl Acetate	500	U	500	39	
95-47-6	o-Xylene	500	U	500	20	
156-60-5	trans-1,2-Dichloroethene	560		500	33	
10061-02-6	trans-1,3-Dichloropropene	500	U	500	20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	9/18/12 13:32	
Dibromofluoromethane	97	89-119	9/18/12 13:32	
Toluene-d8	99	87-121	9/18/12 13:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0835
Date Received: 9/14/12
Date Analyzed: 9/20/12 11:12

Sample Name: LC34-BW0003C-038.5-20120913
Lab Code: R1206126-007

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star735.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	9.6		5.0	
74-85-1	Ethene	410		5.0	
74-82-8	Methane	180		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0003D-045.5-20120913
Lab Code: R1206126-008

Service Request: R1206126
Date Collected: 9/13/12 1008
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	50.1		mg/L	4.0	4	NA	9/22/12 20:08	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1008
Date Received: 9/14/12
Date Analyzed: 9/18/12 14:00

Sample Name: LC34-BW0003D-045.5-20120913
Lab Code: R1206126-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9424.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100 U	100	7.2	
79-34-5	1,1,2,2-Tetrachloroethane	100 U	100	5.0	
79-00-5	1,1,2-Trichloroethane	100 U	100	6.9	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	67 I	100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100 U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100 U	100	12	
120-82-1	1,2,4-Trichlorobenzene	100 U	100	4.7	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100 U	100	15	
106-93-4	1,2-Dibromoethane	100 U	100	4.8	
95-50-1	1,2-Dichlorobenzene	100 U	100	4.2	
107-06-2	1,2-Dichloroethane	100 U	100	7.2	
78-87-5	1,2-Dichloropropane	100 U	100	4.0	
541-73-1	1,3-Dichlorobenzene	100 U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100 U	100	4.0	
71-36-3	n-Butanol	5000 U	5000	350	
78-93-3	2-Butanone (MEK)	200 U	200	17	
591-78-6	2-Hexanone	200 U	200	34	
108-10-1	4-Methyl-2-pentanone	200 U	200	14	
67-64-1	Acetone	200 U	200	25	
71-43-2	Benzene	100 U	100	4.0	
75-27-4	Bromodichloromethane	100 U	100	6.4	
75-25-2	Bromoform	100 U	100	8.4	
74-83-9	Bromomethane	100 U	100	5.8	
75-15-0	Carbon Disulfide	57 I	200	4.4	
56-23-5	Carbon Tetrachloride	100 U	100	9.0	
108-90-7	Chlorobenzene	100 U	100	5.8	
75-00-3	Chloroethane	100 U	100	4.8	
67-66-3	Chloroform	100 U	100	5.0	
74-87-3	Chloromethane	100 U	100	4.2	
110-82-7	Cyclohexane	200 U	200	5.0	
124-48-1	Dibromochloromethane	100 U	100	6.2	
75-71-8	Dichlorodifluoromethane (CFC 12)	100 U	100	9.3	
75-09-2	Dichloromethane	100 U	100	6.4	
100-41-4	Ethylbenzene	100 U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1008
Date Received: 9/14/12
Date Analyzed: 9/18/12 14:00

Sample Name: LC34-BW0003D-045.5-20120913
Lab Code: RI206126-008

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9424.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	8.6	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	5.8	
108-87-2	Methylcyclohexane	200	U	200	5.4	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	6.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	100	U	100	4.4	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	2600		100	6.4	
156-59-2	cis-1,2-Dichloroethene	86	I	100	6.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.8	
179601-23-1	m,p-Xylenes	100	U	100	6.7	
123-86-4	n-Butyl Acetate	100	U	100	7.9	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	61	I	100	6.7	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	101	85-122	9/18/12 14:00	
Dibromofluoromethane	97	89-119	9/18/12 14:00	
Toluene-d8	100	87-121	9/18/12 14:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1008
Date Received: 9/14/12
Date Analyzed: 9/20/12 11:31

Sample Name: LC34-BW0003D-045.5-20120913
Lab Code: R1206126-008

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star736.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 25

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	26		25	
74-85-1	Ethene	1200		25	
74-82-8	Methane	1400		25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0003E-052.5-20120913
Lab Code: R1206126-009

Service Request: R1206126
Date Collected: 9/13/12 0938
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	37.5		mg/L	4.0	4	NA	9/22/12 20:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0938
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:02

Sample Name: LC34-BW0003E-052.5-20120913
Lab Code: R1206126-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9451.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	13	U	13	0.90	
79-34-5	1,1,2,2-Tetrachloroethane	13	U	13	0.63	
79-00-5	1,1,2-Trichloroethane	13	U	13	0.86	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	8.9	I	13	0.78	
75-34-3	1,1-Dichloroethane (1,1-DCA)	13	U	13	0.50	
75-35-4	1,1-Dichloroethene (1,1-DCE)	13	U	13	1.5	
120-82-1	1,2,4-Trichlorobenzene	13	U	13	0.58	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	13	U	13	1.9	
106-93-4	1,2-Dibromoethane	13	U	13	0.60	
95-50-1	1,2-Dichlorobenzene	13	U	13	0.53	
107-06-2	1,2-Dichloroethane	13	U	13	0.90	
78-87-5	1,2-Dichloropropane	13	U	13	0.50	
541-73-1	1,3-Dichlorobenzene	13	U	13	0.50	
106-46-7	1,4-Dichlorobenzene	13	U	13	0.50	
71-36-3	n-Butanol	630	U	630	44	
78-93-3	2-Butanone (MEK)	25	U	25	2.1	
591-78-6	2-Hexanone	25	U	25	4.2	
108-10-1	4-Methyl-2-pentanone	25	U	25	1.7	
67-64-1	Acetone	5.9	I	25	3.1	
71-43-2	Benzene	13	U	13	0.50	
75-27-4	Bromodichloromethane	13	U	13	0.80	
75-25-2	Bromoform	13	U	13	1.1	
74-83-9	Bromomethane	13	U	13	0.73	
75-15-0	Carbon Disulfide	6.7	I	25	0.55	
56-23-5	Carbon Tetrachloride	13	U	13	1.2	
108-90-7	Chlorobenzene	13	U	13	0.73	
75-00-3	Chloroethane	13	U	13	0.60	
67-66-3	Chloroform	13	U	13	0.63	
74-87-3	Chloromethane	13	U	13	0.53	
110-82-7	Cyclohexane	25	U	25	0.63	
124-48-1	Dibromochloromethane	13	U	13	0.78	
75-71-8	Dichlorodifluoromethane (CFC 12)	13	U	13	1.2	
75-09-2	Dichloromethane	13	U	13	0.80	
100-41-4	Ethylbenzene	13	U	13	0.50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0938
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:02

Sample Name: LC34-BW0003E-052.5-20120913
Lab Code: R1206126-009

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9451.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	13	U	13	0.50	
79-20-9	Methyl Acetate	25	U	25	1.1	
1634-04-4	Methyl tert-Butyl Ether	13	U	13	0.73	
108-87-2	Methylcyclohexane	25	U	25	0.68	
100-42-5	Styrene	13	U	13	0.50	
127-18-4	Tetrachloroethene (PCE)	13	U	13	0.75	
108-88-3	Toluene	13	U	13	0.50	
79-01-6	Trichloroethene (TCE)	3.1	I	13	0.55	
75-69-4	Trichlorofluoromethane (CFC 11)	13	U	13	0.50	
75-01-4	Vinyl Chloride	270		13	0.80	
156-59-2	cis-1,2-Dichloroethene	58		13	0.75	
10061-01-5	cis-1,3-Dichloropropene	13	U	13	0.60	
179601-23-1	m,p-Xylenes	13	U	13	0.83	
123-86-4	n-Butyl Acetate	30		13	0.98	
95-47-6	o-Xylene	13	U	13	0.50	
156-60-5	trans-1,2-Dichloroethene	9.4	I	13	0.83	
10061-02-6	trans-1,3-Dichloropropene	13	U	13	0.50	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	9/19/12 03:02	
Dibromofluoromethane	99	89-119	9/19/12 03:02	
Toluene-d8	102	87-121	9/19/12 03:02	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0938
Date Received: 9/14/12
Date Analyzed: 9/20/12 12:21

Sample Name: LC34-BW0003E-052.5-20120913
Lab Code: R1206126-009

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star737.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	21		20	
74-85-1	Ethene	1000		20	
74-82-8	Methane	920		20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-BW0003F-059.5-20120913
Lab Code: R1206126-010

Service Request: R1206126
Date Collected: 9/13/12 0910
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	4.9		mg/L	1.0	1	NA	9/22/12 21:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0910
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:30

Sample Name: LC34-BW0003F-059.5-20120913
Lab Code: R1206126-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9452.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	1.7 I	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	1.0 I	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0910
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:30

Sample Name: LC34-BW0003F-059.5-20120913
Lab Code: R1206126-010

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9452.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	0.82	I	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	90		5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	3.6	I	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	2.7	I	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	103	85-122	9/19/12 03:30	
Dibromofluoromethane	99	89-119	9/19/12 03:30	
Toluene-d8	102	87-121	9/19/12 03:30	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0910
Date Received: 9/14/12
Date Analyzed: 9/20/12 12:34

Sample Name: LC34-BW0003F-059.5-20120913
Lab Code: R1206126-010

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star738.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 20

CAS No.	Analyte Name	Result Q	MRL	Note
74-84-0	Ethane	20 U	20	
74-85-1	Ethene	290	20	
74-82-8	Methane	1100	20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-RW0007-038.5-20120913
Lab Code: R1206126-011

Service Request: R1206126
Date Collected: 9/13/12 0951
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	9.6		mg/L	1.0	1	NA	9/24/12 21:10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0951
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:58

Sample Name: LC34-RW0007-038.5-20120913
Lab Code: R1206126-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9453.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100	U	100	7.2	
79-34-5	1,1,2,2-Tetrachloroethane	100	U	100	5.0	
79-00-5	1,1,2-Trichloroethane	100	U	100	6.9	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2900		100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100	U	100	12	
120-82-1	1,2,4-Trichlorobenzene	100	U	100	4.7	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	15	
106-93-4	1,2-Dibromoethane	100	U	100	4.8	
95-50-1	1,2-Dichlorobenzene	100	U	100	4.2	
107-06-2	1,2-Dichloroethane	100	U	100	7.2	
78-87-5	1,2-Dichloropropane	100	U	100	4.0	
541-73-1	1,3-Dichlorobenzene	100	U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100	U	100	4.0	
71-36-3	n-Butanol	5000	U	5000	350	
78-93-3	2-Butanone (MEK)	200	U	200	17	
591-78-6	2-Hexanone	200	U	200	34	
108-10-1	4-Methyl-2-pentanone	200	U	200	14	
67-64-1	Acetone	200	U	200	25	
71-43-2	Benzene	100	U	100	4.0	
75-27-4	Bromodichloromethane	100	U	100	6.4	
75-25-2	Bromoform	100	U	100	8.4	
74-83-9	Bromomethane	100	U	100	5.8	
75-15-0	Carbon Disulfide	9.6	I	200	4.4	
56-23-5	Carbon Tetrachloride	100	U	100	9.0	
108-90-7	Chlorobenzene	100	U	100	5.8	
75-00-3	Chloroethane	100	U	100	4.8	
67-66-3	Chloroform	100	U	100	5.0	
74-87-3	Chloromethane	100	U	100	4.2	
110-82-7	Cyclohexane	200	U	200	5.0	
124-48-1	Dibromochloromethane	100	U	100	6.2	
75-71-8	Dichlorodifluoromethane (CFC 12)	100	U	100	9.3	
75-09-2	Dichloromethane	100	U	100	6.4	
100-41-4	Ethylbenzene	100	U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0951
Date Received: 9/14/12
Date Analyzed: 9/19/12 03:58

Sample Name: LC34-RW0007-038.5-20120913
Lab Code: R1206126-011

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9453.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	8.6	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	5.8	
108-87-2	Methylcyclohexane	200	U	200	5.4	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	6.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	210		100	4.4	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	2000		100	6.4	
156-59-2	cis-1,2-Dichloroethene	2300		100	6.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.8	
179601-23-1	m,p-Xylenes	100	U	100	6.7	
123-86-4	n-Butyl Acetate	100	U	100	7.9	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	100		100	6.7	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	106	85-122	9/19/12 03:58	
Dibromofluoromethane	100	89-119	9/19/12 03:58	
Toluene-d8	104	87-121	9/19/12 03:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0951
Date Received: 9/14/12
Date Analyzed: 9/20/12 13:06

Sample Name: LC34-RW0007-038.5-20120913
Lab Code: R1206126-011

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star741.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	11		5.0	
74-85-1	Ethene	370		5.0	
74-82-8	Methane	360		5.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-RW0008-052.0-20120913
Lab Code: R1206126-012

Service Request: R1206126
Date Collected: 9/13/12 1020
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	27.0		mg/L	4.0	4	NA	9/22/12 22:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1020
Date Received: 9/14/12
Date Analyzed: 9/19/12 04:25

Sample Name: LC34-RW0008-052.0-20120913
Lab Code: R1206126-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9454.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 5

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	25 U	25	1.8	
79-34-5	1,1,2,2-Tetrachloroethane	25 U	25	1.3	
79-00-5	1,1,2-Trichloroethane	25 U	25	1.8	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	530	25	1.6	
75-34-3	1,1-Dichloroethane (1,1-DCA)	25 U	25	1.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	25 U	25	2.9	
120-82-1	1,2,4-Trichlorobenzene	25 U	25	1.2	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	25 U	25	3.7	
106-93-4	1,2-Dibromoethane	25 U	25	1.2	
95-50-1	1,2-Dichlorobenzene	25 U	25	1.1	
107-06-2	1,2-Dichloroethane	25 U	25	1.8	
78-87-5	1,2-Dichloropropane	25 U	25	1.0	
541-73-1	1,3-Dichlorobenzene	25 U	25	1.0	
106-46-7	1,4-Dichlorobenzene	25 U	25	1.0	
71-36-3	n-Butanol	1300 U	1300	87	
78-93-3	2-Butanone (MEK)	50 U	50	4.1	
591-78-6	2-Hexanone	50 U	50	8.3	
108-10-1	4-Methyl-2-pentanone	50 U	50	3.4	
67-64-1	Acetone	8.6 I	50	6.2	
71-43-2	Benzene	25 U	25	1.0	
75-27-4	Bromodichloromethane	25 U	25	1.6	
75-25-2	Bromoform	25 U	25	2.1	
74-83-9	Bromomethane	25 U	25	1.5	
75-15-0	Carbon Disulfide	9.4 I	50	1.1	
56-23-5	Carbon Tetrachloride	25 U	25	2.3	
108-90-7	Chlorobenzene	25 U	25	1.5	
75-00-3	Chloroethane	25 U	25	1.2	
67-66-3	Chloroform	25 U	25	1.3	
74-87-3	Chloromethane	25 U	25	1.1	
110-82-7	Cyclohexane	50 U	50	1.3	
124-48-1	Dibromochloromethane	25 U	25	1.6	
75-71-8	Dichlorodifluoromethane (CFC 12)	25 U	25	2.4	
75-09-2	Dichloromethane	25 U	25	1.6	
100-41-4	Ethylbenzene	25 U	25	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1020
Date Received: 9/14/12
Date Analyzed: 9/19/12 04:25

Sample Name: LC34-RW0008-052.0-20120913
Lab Code: R1206126-012

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9454.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 5

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	25	U	25	1.0	
79-20-9	Methyl Acetate	50	U	50	2.2	
1634-04-4	Methyl tert-Butyl Ether	25	U	25	1.5	
108-87-2	Methylcyclohexane	50	U	50	1.4	
100-42-5	Styrene	25	U	25	1.0	
127-18-4	Tetrachloroethene (PCE)	25	U	25	1.5	
108-88-3	Toluene	25	U	25	1.0	
79-01-6	Trichloroethene (TCE)	56		25	1.1	
75-69-4	Trichlorofluoromethane (CFC 11)	25	U	25	1.0	
75-01-4	Vinyl Chloride	710		25	1.6	
156-59-2	cis-1,2-Dichloroethene	750		25	1.5	
10061-01-5	cis-1,3-Dichloropropene	25	U	25	1.2	
179601-23-1	m,p-Xylenes	25	U	25	1.7	
123-86-4	n-Butyl Acetate	25	U	25	2.0	
95-47-6	o-Xylene	25	U	25	1.0	
156-60-5	trans-1,2-Dichloroethene	14	I	25	1.7	
10061-02-6	trans-1,3-Dichloropropene	25	U	25	1.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	9/19/12 04:25	
Dibromofluoromethane	102	89-119	9/19/12 04:25	
Toluene-d8	104	87-121	9/19/12 04:25	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1020
Date Received: 9/14/12
Date Analyzed: 9/20/12 13:23

Sample Name: LC34-RW0008-052.0-20120913
Lab Code: R1206126-012

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star742.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	30		10	
74-85-1	Ethene	940		10	
74-82-8	Methane	760		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120913
Lab Code: R1206126-013

Service Request: R1206126
Date Collected: 9/13/12 0824
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	2.3		mg/L	1.0	1	NA	9/22/12 23:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0824
Date Received: 9/14/12
Date Analyzed: 9/20/12 13:54

Sample Name: LC34-IW0002I-027.5-20120913
Lab Code: R1206126-013

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star961.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.6		1.0	
74-85-1	Ethene	3.1		1.0	
74-82-8	Methane	24		1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120913
Lab Code: R1206126-013

Service Request: R1206126
Date Collected: 9/13/12 0824
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	25	U	25	1.8	5	NA	9/17/12 19:13		309687	
1,1,2,2-Tetrachloroethane	25	U	25	1.3	5	NA	9/17/12 19:13		309687	
1,1,2-Trichloroethane	25	U	25	1.8	5	NA	9/17/12 19:13		309687	
1,1,2-Trichloro-1,2,2-trifluoroethane	11000		500	31	100	NA	9/19/12 04:53		309913	
1,1-Dichloroethane (1,1-DCA)	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
1,1-Dichloroethene (1,1-DCE)	25	U	25	2.9	5	NA	9/17/12 19:13		309687	
1,2,4-Trichlorobenzene	25	U	25	1.2	5	NA	9/17/12 19:13		309687	
1,2-Dibromo-3-chloropropane (DBCP)	25	U	25	3.7	5	NA	9/17/12 19:13		309687	
1,2-Dibromoethane	25	U	25	1.2	5	NA	9/17/12 19:13		309687	
1,2-Dichlorobenzene	25	U	25	1.1	5	NA	9/17/12 19:13		309687	
1,2-Dichloroethane	25	U	25	1.8	5	NA	9/17/12 19:13		309687	
1,2-Dichloropropane	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
1,3-Dichlorobenzene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
1,4-Dichlorobenzene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
n-Butanol	1300	U	1300	87	5	NA	9/17/12 19:13		309687	
2-Butanone (MEK)	50	U	50	4.1	5	NA	9/17/12 19:13		309687	
2-Hexanone	50	U	50	8.3	5	NA	9/17/12 19:13		309687	
4-Methyl-2-pentanone	50	U	50	3.4	5	NA	9/17/12 19:13		309687	
Acetone	50	U	50	6.2	5	NA	9/17/12 19:13		309687	
Benzene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Bromodichloromethane	25	U	25	1.6	5	NA	9/17/12 19:13		309687	
Bromoform	25	U	25	2.1	5	NA	9/17/12 19:13		309687	
Bromomethane	25	U	25	1.5	5	NA	9/17/12 19:13		309687	
Carbon Disulfide	50	U	50	1.1	5	NA	9/17/12 19:13		309687	
Carbon Tetrachloride	25	U	25	2.3	5	NA	9/17/12 19:13		309687	
Chlorobenzene	25	U	25	1.5	5	NA	9/17/12 19:13		309687	
Chloroethane	25	U	25	1.2	5	NA	9/17/12 19:13		309687	
Chloroform	25	U	25	1.3	5	NA	9/17/12 19:13		309687	
Chloromethane	25	U	25	1.1	5	NA	9/17/12 19:13		309687	
Cyclohexane	50	U	50	1.3	5	NA	9/17/12 19:13		309687	
Dibromochloromethane	25	U	25	1.6	5	NA	9/17/12 19:13		309687	
Dichlorodifluoromethane (CFC 12)	25	U	25	2.4	5	NA	9/17/12 19:13		309687	
Dichloromethane	25	U	25	1.6	5	NA	9/17/12 19:13		309687	
Ethylbenzene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Isopropylbenzene (Cumene)	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Methyl Acetate	50	U	50	2.2	5	NA	9/17/12 19:13		309687	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002I-027.5-20120913
Lab Code: R1206126-013

Service Request: R1206126
Date Collected: 9/13/12 0824
Date Received: 9/14/12

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Methyl tert-Butyl Ether	25	U	25	1.5	5	NA	9/17/12 19:13		309687	
Methylcyclohexane	50	U	50	1.4	5	NA	9/17/12 19:13		309687	
Styrene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Tetrachloroethene (PCE)	25	U	25	1.5	5	NA	9/17/12 19:13		309687	
Toluene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Trichloroethene (TCE)	5.5	I	25	1.1	5	NA	9/17/12 19:13		309687	
Trichlorofluoromethane (CFC 11)	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
Vinyl Chloride	43		25	1.6	5	NA	9/17/12 19:13		309687	
cis-1,2-Dichloroethene	500		25	1.5	5	NA	9/17/12 19:13		309687	
cis-1,3-Dichloropropene	25	U	25	1.2	5	NA	9/17/12 19:13		309687	
m,p-Xylenes	25	U	25	1.7	5	NA	9/17/12 19:13		309687	
n-Butyl Acetate	25	U	25	2.0	5	NA	9/17/12 19:13		309687	
o-Xylene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	
trans-1,2-Dichloroethene	17	I	25	1.7	5	NA	9/17/12 19:13		309687	
trans-1,3-Dichloropropene	25	U	25	1.0	5	NA	9/17/12 19:13		309687	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	105	85-122	9/17/12 19:13	
Dibromofluoromethane	99	89-119	9/17/12 19:13	
Toluene-d8	105	87-121	9/17/12 19:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002D-037.5-20120913
Lab Code: R1206126-014

Service Request: R1206126
Date Collected: 9/13/12 0851
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	8.7	mg/L	1.0	1	NA	9/22/12 00:06	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0851
Date Received: 9/14/12
Date Analyzed: 9/19/12 05:21

Sample Name: LC34-IW0002D-037.5-20120913
Lab Code: R1206126-014

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9456.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100	U	100	7.2	
79-34-5	1,1,2,2-Tetrachloroethane	100	U	100	5.0	
79-00-5	1,1,2-Trichloroethane	100	U	100	6.9	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	100	U	100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100	U	100	12	
120-82-1	1,2,4-Trichlorobenzene	100	U	100	4.7	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	15	
106-93-4	1,2-Dibromoethane	100	U	100	4.8	
95-50-1	1,2-Dichlorobenzene	100	U	100	4.2	
107-06-2	1,2-Dichloroethane	100	U	100	7.2	
78-87-5	1,2-Dichloropropane	100	U	100	4.0	
541-73-1	1,3-Dichlorobenzene	100	U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100	U	100	4.0	
71-36-3	n-Butanol	5000	U	5000	350	
78-93-3	2-Butanone (MEK)	200	U	200	17	
591-78-6	2-Hexanone	200	U	200	34	
108-10-1	4-Methyl-2-pentanone	200	U	200	14	
67-64-1	Acetone	200	U	200	25	
71-43-2	Benzene	100	U	100	4.0	
75-27-4	Bromodichloromethane	100	U	100	6.4	
75-25-2	Bromoform	100	U	100	8.4	
74-83-9	Bromomethane	100	U	100	5.8	
75-15-0	Carbon Disulfide	20	I	200	4.4	
56-23-5	Carbon Tetrachloride	100	U	100	9.0	
108-90-7	Chlorobenzene	100	U	100	5.8	
75-00-3	Chloroethane	100	U	100	4.8	
67-66-3	Chloroform	100	U	100	5.0	
74-87-3	Chloromethane	100	U	100	4.2	
110-82-7	Cyclohexane	200	U	200	5.0	
124-48-1	Dibromochloromethane	100	U	100	6.2	
75-71-8	Dichlorodifluoromethane (CFC 12)	100	U	100	9.3	
75-09-2	Dichloromethane	100	U	100	6.4	
100-41-4	Ethylbenzene	100	U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0851
Date Received: 9/14/12
Date Analyzed: 9/19/12 05:21

Sample Name: LC34-IW0002D-037.5-20120913
Lab Code: R1206126-014

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9456.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	8.6	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	5.8	
108-87-2	Methylcyclohexane	200	U	200	5.4	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	6.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	5.6	I	100	4.4	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	2400		100	6.4	
156-59-2	cis-1,2-Dichloroethene	1300		100	6.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.8	
179601-23-1	m,p-Xylenes	100	U	100	6.7	
123-86-4	n-Butyl Acetate	100	U	100	7.9	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	110		100	6.7	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	9/19/12 05:21	
Dibromofluoromethane	98	89-119	9/19/12 05:21	
Toluene-d8	104	87-121	9/19/12 05:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0851
Date Received: 9/14/12
Date Analyzed: 9/20/12 14:29

Sample Name: LC34-IW0002D-037.5-20120913
Lab Code: R1206126-014

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star963.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 10

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	24		10	
74-85-1	Ethene	670		10	
74-82-8	Methane	310		10	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002DI-052.5-20120913
Lab Code: R1206126-015

Service Request: R1206126
Date Collected: 9/13/12 0922
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	37.4		mg/L	4.0	4	NA	9/24/12 21:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0922
Date Received: 9/14/12
Date Analyzed: 9/19/12 05:49

Sample Name: LC34-IW0002DI-052.5-20120913
Lab Code: R1206126-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9457.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	100	U	100	7.2	
79-34-5	1,1,2,2-Tetrachloroethane	100	U	100	5.0	
79-00-5	1,1,2-Trichloroethane	100	U	100	6.9	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	55	I	100	6.2	
75-34-3	1,1-Dichloroethane (1,1-DCA)	100	U	100	4.0	
75-35-4	1,1-Dichloroethene (1,1-DCE)	100	U	100	12	
120-82-1	1,2,4-Trichlorobenzene	100	U	100	4.7	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	100	U	100	15	
106-93-4	1,2-Dibromoethane	100	U	100	4.8	
95-50-1	1,2-Dichlorobenzene	100	U	100	4.2	
107-06-2	1,2-Dichloroethane	100	U	100	7.2	
78-87-5	1,2-Dichloropropane	100	U	100	4.0	
541-73-1	1,3-Dichlorobenzene	100	U	100	4.0	
106-46-7	1,4-Dichlorobenzene	100	U	100	4.0	
71-36-3	n-Butanol	5000	U	5000	350	
78-93-3	2-Butanone (MEK)	200	U	200	17	
591-78-6	2-Hexanone	200	U	200	34	
108-10-1	4-Methyl-2-pentanone	200	U	200	14	
67-64-1	Acetone	200	U	200	25	
71-43-2	Benzene	100	U	100	4.0	
75-27-4	Bromodichloromethane	100	U	100	6.4	
75-25-2	Bromoform	100	U	100	8.4	
74-83-9	Bromomethane	100	U	100	5.8	
75-15-0	Carbon Disulfide	7.6	I	200	4.4	
56-23-5	Carbon Tetrachloride	100	U	100	9.0	
108-90-7	Chlorobenzene	100	U	100	5.8	
75-00-3	Chloroethane	100	U	100	4.8	
67-66-3	Chloroform	100	U	100	5.0	
74-87-3	Chloromethane	100	U	100	4.2	
110-82-7	Cyclohexane	200	U	200	5.0	
124-48-1	Dibromochloromethane	100	U	100	6.2	
75-71-8	Dichlorodifluoromethane (CFC 12)	100	U	100	9.3	
75-09-2	Dichloromethane	100	U	100	6.4	
100-41-4	Ethylbenzene	100	U	100	4.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 0922
Date Received: 9/14/12
Date Analyzed: 9/19/12 05:49

Sample Name: LC34-IW0002DI-052.5-20120913
Lab Code: R1206126-015

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9457.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 20

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	100	U	100	4.0	
79-20-9	Methyl Acetate	200	U	200	8.6	
1634-04-4	Methyl tert-Butyl Ether	100	U	100	5.8	
108-87-2	Methylcyclohexane	200	U	200	5.4	
100-42-5	Styrene	100	U	100	4.0	
127-18-4	Tetrachloroethene (PCE)	100	U	100	6.0	
108-88-3	Toluene	100	U	100	4.0	
79-01-6	Trichloroethene (TCE)	100	U	100	4.4	
75-69-4	Trichlorofluoromethane (CFC 11)	100	U	100	4.0	
75-01-4	Vinyl Chloride	2000		100	6.4	
156-59-2	cis-1,2-Dichloroethene	48	I	100	6.0	
10061-01-5	cis-1,3-Dichloropropene	100	U	100	4.8	
179601-23-1	m,p-Xylenes	100	U	100	6.7	
123-86-4	n-Butyl Acetate	100	U	100	7.9	
95-47-6	o-Xylene	100	U	100	4.0	
156-60-5	trans-1,2-Dichloroethene	57	I	100	6.7	
10061-02-6	trans-1,3-Dichloropropene	100	U	100	4.0	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	9/19/12 05:49	
Dibromofluoromethane	98	89-119	9/19/12 05:49	
Toluene-d8	100	87-121	9/19/12 05:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0002DI-052.5-20120913
Lab Code: R1206126-015

Service Request: R1206126
Date Collected: 9/13/12 0922
Date Received: 9/14/12
Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
Ethane	30		25	25	NA	9/20/12 14:39		310244	
Ethene	1600		25	25	NA	9/20/12 14:39		310244	
Methane	2700		50	50	NA	9/20/12 14:49		310244	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: LC34-IW0076-075.0-20120913
Lab Code: R1206126-016

Service Request: R1206126
Date Collected: 9/13/12 1102
Date Received: 9/14/12

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	3.1		mg/L	1.0	1	NA	9/24/12 23:49	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1102
Date Received: 9/14/12
Date Analyzed: 9/17/12 20:37

Sample Name: LC34-IW0076-075.0-20120913
Lab Code: R1206126-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9406.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	87		5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	18	
78-93-3	2-Butanone (MEK)	10	U	10	0.81	
591-78-6	2-Hexanone	10	U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.67	
67-64-1	Acetone	10	U	10	1.3	
71-43-2	Benzene	5.0	U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.32	
75-25-2	Bromoform	5.0	U	5.0	0.42	
74-83-9	Bromomethane	5.0	U	5.0	0.29	
75-15-0	Carbon Disulfide	10	U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.45	
108-90-7	Chlorobenzene	5.0	U	5.0	0.29	
75-00-3	Chloroethane	5.0	U	5.0	0.24	
67-66-3	Chloroform	5.0	U	5.0	0.25	
74-87-3	Chloromethane	5.0	U	5.0	0.21	
110-82-7	Cyclohexane	10	U	10	0.25	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.46	
75-09-2	Dichloromethane	5.0	U	5.0	0.32	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1102
Date Received: 9/14/12
Date Analyzed: 9/17/12 20:37

Sample Name: LC34-IW0076-075.0-20120913
Lab Code: R1206126-016

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9406.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0 U	5.0	0.20	
79-20-9	Methyl Acetate	10 U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0 U	5.0	0.29	
108-87-2	Methylcyclohexane	10 U	10	0.27	
100-42-5	Styrene	5.0 U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0 U	5.0	0.30	
108-88-3	Toluene	5.0 U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	0.49 I	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0 U	5.0	0.20	
75-01-4	Vinyl Chloride	3.5 I	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0 U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0 U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0 U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0 U	5.0	0.39	
95-47-6	o-Xylene	5.0 U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	3.9 I	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0 U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	9/17/12 20:37	
Dibromofluoromethane	99	89-119	9/17/12 20:37	
Toluene-d8	103	87-121	9/17/12 20:37	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: 9/13/12 1102
Date Received: 9/14/12
Date Analyzed: 9/20/12 15:16

Sample Name: LC34-IW0076-075.0-20120913
Lab Code: R1206126-016

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star967.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 2.5

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	2.5	U	2.5	
74-85-1	Ethene	6.7		2.5	
74-82-8	Methane	210		2.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1206126-MB1

Service Request: R1206126
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/22/12 10:50	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: R1206126-MB2

Service Request: R1206126
Date Collected: NA
Date Received: NA

Basis: NA

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution	Date	Date	Note
						Factor	Extracted	Analyzed	
Carbon, Total Organic (TOC), Average	9060A	1.0	U	mg/L	1.0	1	NA	9/24/12 18:50	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/17/12 11:48

Sample Name: Method Blank
Lab Code: RQ1210841-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9390.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	10 U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/17/12 11:48

Sample Name: Method Blank
Lab Code: RQ1210841-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091712\F9390.D\

Analysis Lot: 309687
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	9/17/12 11:48	
Dibromofluoromethane	97	89-119	9/17/12 11:48	
Toluene-d8	104	87-121	9/17/12 11:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/18/12 10:54

Sample Name: Method Blank
Lab Code: RQ1210928-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9418.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0 U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0 U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0 U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0 U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0 U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0 U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0 U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0 U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0 U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0 U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0 U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0 U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0 U	5.0	0.20	
71-36-3	n-Butanol	250 U	250	18	
78-93-3	2-Butanone (MEK)	10 U	10	0.81	
591-78-6	2-Hexanone	10 U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10 U	10	0.67	
67-64-1	Acetone	10 U	10	1.3	
71-43-2	Benzene	5.0 U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0 U	5.0	0.32	
75-25-2	Bromoform	5.0 U	5.0	0.42	
74-83-9	Bromomethane	5.0 U	5.0	0.29	
75-15-0	Carbon Disulfide	10 U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0 U	5.0	0.45	
108-90-7	Chlorobenzene	5.0 U	5.0	0.29	
75-00-3	Chloroethane	5.0 U	5.0	0.24	
67-66-3	Chloroform	5.0 U	5.0	0.25	
74-87-3	Chloromethane	5.0 U	5.0	0.21	
110-82-7	Cyclohexane	10 U	10	0.25	
124-48-1	Dibromochloromethane	5.0 U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0 U	5.0	0.46	
75-09-2	Dichloromethane	5.0 U	5.0	0.32	
100-41-4	Ethylbenzene	5.0 U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/18/12 10:54

Sample Name: Method Blank
Lab Code: RQ1210928-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9418.D\

Analysis Lot: 309911
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/18/12 10:54	
Dibromofluoromethane	94	89-119	9/18/12 10:54	
Toluene-d8	98	87-121	9/18/12 10:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/18/12 23:47

Sample Name: Method Blank
Lab Code: RQ1210929-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9444.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
71-55-6	1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.36	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.25	
79-00-5	1,1,2-Trichloroethane	5.0	U	5.0	0.34	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U	5.0	0.31	
75-34-3	1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.20	
75-35-4	1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.57	
120-82-1	1,2,4-Trichlorobenzene	5.0	U	5.0	0.23	
96-12-8	1,2-Dibromo-3-chloropropane (DBCP)	5.0	U	5.0	0.74	
106-93-4	1,2-Dibromoethane	5.0	U	5.0	0.24	
95-50-1	1,2-Dichlorobenzene	5.0	U	5.0	0.21	
107-06-2	1,2-Dichloroethane	5.0	U	5.0	0.36	
78-87-5	1,2-Dichloropropane	5.0	U	5.0	0.20	
541-73-1	1,3-Dichlorobenzene	5.0	U	5.0	0.20	
106-46-7	1,4-Dichlorobenzene	5.0	U	5.0	0.20	
71-36-3	n-Butanol	250	U	250	18	
78-93-3	2-Butanone (MEK)	10	U	10	0.81	
591-78-6	2-Hexanone	10	U	10	1.7	
108-10-1	4-Methyl-2-pentanone	10	U	10	0.67	
67-64-1	Acetone	10	U	10	1.3	
71-43-2	Benzene	5.0	U	5.0	0.20	
75-27-4	Bromodichloromethane	5.0	U	5.0	0.32	
75-25-2	Bromoform	5.0	U	5.0	0.42	
74-83-9	Bromomethane	5.0	U	5.0	0.29	
75-15-0	Carbon Disulfide	10	U	10	0.22	
56-23-5	Carbon Tetrachloride	5.0	U	5.0	0.45	
108-90-7	Chlorobenzene	5.0	U	5.0	0.29	
75-00-3	Chloroethane	5.0	U	5.0	0.24	
67-66-3	Chloroform	5.0	U	5.0	0.25	
74-87-3	Chloromethane	5.0	U	5.0	0.21	
110-82-7	Cyclohexane	10	U	10	0.25	
124-48-1	Dibromochloromethane	5.0	U	5.0	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	5.0	U	5.0	0.46	
75-09-2	Dichloromethane	5.0	U	5.0	0.32	
100-41-4	Ethylbenzene	5.0	U	5.0	0.20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/18/12 23:47

Sample Name: Method Blank
Lab Code: RQ1210929-03

Units: µg/L
Basis: NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C
Data File Name: J:\ACQUDATA\MSVOA8\DATA\091812\F9444.D\

Analysis Lot: 309913
Instrument Name: R-MS-08
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	MDL	Note
98-82-8	Isopropylbenzene (Cumene)	5.0	U	5.0	0.20	
79-20-9	Methyl Acetate	10	U	10	0.43	
1634-04-4	Methyl tert-Butyl Ether	5.0	U	5.0	0.29	
108-87-2	Methylcyclohexane	10	U	10	0.27	
100-42-5	Styrene	5.0	U	5.0	0.20	
127-18-4	Tetrachloroethene (PCE)	5.0	U	5.0	0.30	
108-88-3	Toluene	5.0	U	5.0	0.20	
79-01-6	Trichloroethene (TCE)	5.0	U	5.0	0.22	
75-69-4	Trichlorofluoromethane (CFC 11)	5.0	U	5.0	0.20	
75-01-4	Vinyl Chloride	5.0	U	5.0	0.32	
156-59-2	cis-1,2-Dichloroethene	5.0	U	5.0	0.30	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	5.0	0.24	
179601-23-1	m,p-Xylenes	5.0	U	5.0	0.33	
123-86-4	n-Butyl Acetate	5.0	U	5.0	0.39	
95-47-6	o-Xylene	5.0	U	5.0	0.20	
156-60-5	trans-1,2-Dichloroethene	5.0	U	5.0	0.33	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	5.0	0.20	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	85-122	9/18/12 23:47	
Dibromofluoromethane	98	89-119	9/18/12 23:47	
Toluene-d8	102	87-121	9/18/12 23:47	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/19/12 09:20

Sample Name: Method Blank
Lab Code: RQ1211017-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star706.run

Analysis Lot: 310243
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	1.0	U	1.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Collected: NA
Date Received: NA
Date Analyzed: 9/20/12 09:12

Sample Name: Method Blank
Lab Code: RQ1211018-01

Units: µg/L
Basis: NA

Dissolved Gases by GC/FID

Analytical Method: RSK 175
Data File Name: star728.run

Analysis Lot: 310244
Instrument Name: R-GC-02
Dilution Factor: 1

CAS No.	Analyte Name	Result	Q	MRL	Note
74-84-0	Ethane	1.0	U	1.0	
74-85-1	Ethene	1.0	U	1.0	
74-82-8	Methane	1.0	U	1.0	



COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/22/12

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Analyte Name	Method	Lab Control Sample R1206126-LCS1			% Rec Limits
		Result	Spike Amount	% Rec	
Carbon, Total Organic (TOC), Average	9060A	9.41	10.0	94	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/24/12

**Lab Control Sample Summary
General Chemistry Parameters**

Units: mg/L
Basis: NA

		Lab Control Sample R1206126-LCS2			
Analyte Name	Method	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC), Average	9060A	9.64	10.0	96	86 - 117

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

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QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309687

Lab Control Sample
RQ1210841-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.9	20.0	94	67 - 121
1,1,2,2-Tetrachloroethane	20.9	20.0	104	72 - 124
1,1,2-Trichloroethane	20.1	20.0	100	81 - 117
1,1,2-Trichloro-1,2,2-trifluoroethane	16.4	20.0	82	60 - 122
1,1-Dichloroethane (1,1-DCA)	22.4	20.0	112	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.5	20.0	102	67 - 119
1,2,4-Trichlorobenzene	22.1	20.0	110	70 - 128
1,2-Dibromo-3-chloropropane (DBCP)	20.2	20.0	101	64 - 131
1,2-Dibromoethane	20.4	20.0	102	81 - 118
1,2-Dichlorobenzene	20.5	20.0	102	80 - 119
1,2-Dichloroethane	18.4	20.0	92	72 - 130
1,2-Dichloropropane	21.0	20.0	105	83 - 119
1,3-Dichlorobenzene	20.5	20.0	103	79 - 121
1,4-Dichlorobenzene	20.0	20.0	100	79 - 119
n-Butanol	800	1010	80	49 - 182
2-Butanone (MEK)	19.5	20.0	97	60 - 133
2-Hexanone	18.1	20.0	91	61 - 131
4-Methyl-2-pentanone	18.0	20.0	90	61 - 132
Acetone	18.6	20.0	93	64 - 133
Benzene	20.5	20.0	103	78 - 118
Bromodichloromethane	20.1	20.0	100	79 - 123
Bromoform	18.8	20.0	94	69 - 126
Bromomethane	19.6	20.0	98	49 - 124
Carbon Disulfide	20.4	20.0	102	67 - 138
Carbon Tetrachloride	18.6	20.0	93	64 - 129
Chlorobenzene	20.6	20.0	103	80 - 121
Chloroethane	19.4	20.0	97	72 - 130
Chloroform	20.7	20.0	103	75 - 123
Chloromethane	19.1	20.0	95	55 - 139
Cyclohexane	20.0	20.0	100	55 - 132
Dibromochloromethane	19.5	20.0	97	78 - 127
Dichlorodifluoromethane (CFC 12)	16.3	20.0	81	45 - 147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/17/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309687

Lab Control Sample
RQ1210841-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.4	20.0	107	73 - 122
Ethylbenzene	21.0	20.0	105	75 - 123
Isopropylbenzene (Cumene)	20.7	20.0	103	75 - 139
Methyl Acetate	18.3	20.0	92	65 - 131
Methyl tert-Butyl Ether	22.2	20.0	111	75 - 116
Methylcyclohexane	20.3	20.0	102	59 - 127
Styrene	21.2	20.0	106	80 - 121
Tetrachloroethene (PCE)	19.4	20.0	97	71 - 127
Toluene	20.7	20.0	104	77 - 120
Trichloroethene (TCE)	19.7	20.0	98	75 - 122
Trichlorofluoromethane (CFC 11)	17.9	20.0	89	64 - 134
Vinyl Chloride	19.3	20.0	97	68 - 139
cis-1,2-Dichloroethene	22.2	20.0	111	77 - 123
cis-1,3-Dichloropropene	19.9	20.0	100	77 - 125
m,p-Xylenes	42.6	40.0	106	77 - 124
n-Butyl Acetate	19.5	20.0	97	61 - 126
o-Xylene	21.9	20.0	110	77 - 131
trans-1,2-Dichloroethene	21.8	20.0	109	72 - 120
trans-1,3-Dichloropropene	18.4	20.0	92	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126

Date Analyzed: 9/18/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309911

Lab Control Sample
RQ1210928-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	19.7	20.0	98	67 - 121
1,1,2,2-Tetrachloroethane	20.6	20.0	103	72 - 124
1,1,2-Trichloroethane	18.7	20.0	93	81 - 117
1,1,2-Trichloro-1,2,2-trifluoroethane	18.6	20.0	93	60 - 122
1,1-Dichloroethane (1,1-DCA)	23.1	20.0	116	76 - 124
1,1-Dichloroethene (1,1-DCE)	22.5	20.0	113	67 - 119
1,2,4-Trichlorobenzene	21.4	20.0	107	70 - 128
1,2-Dibromo-3-chloropropane (DBCP)	19.4	20.0	97	64 - 131
1,2-Dibromoethane	20.1	20.0	100	81 - 118
1,2-Dichlorobenzene	20.5	20.0	102	80 - 119
1,2-Dichloroethane	18.2	20.0	91	72 - 130
1,2-Dichloropropane	20.5	20.0	103	83 - 119
1,3-Dichlorobenzene	20.8	20.0	104	79 - 121
1,4-Dichlorobenzene	19.8	20.0	99	79 - 119
n-Butanol	800	1010	80	49 - 182
2-Butanone (MEK)	20.3	20.0	102	60 - 133
2-Hexanone	18.3	20.0	91	61 - 131
4-Methyl-2-pentanone	18.7	20.0	93	61 - 132
Acetone	19.4	20.0	97	64 - 133
Benzene	20.0	20.0	100	78 - 118
Bromodichloromethane	18.9	20.0	95	79 - 123
Bromoform	18.5	20.0	93	69 - 126
Bromomethane	20.6	20.0	103	49 - 124
Carbon Disulfide	23.2	20.0	116	67 - 138
Carbon Tetrachloride	19.3	20.0	97	64 - 129
Chlorobenzene	20.9	20.0	104	80 - 121
Chloroethane	20.5	20.0	102	72 - 130
Chloroform	21.0	20.0	105	75 - 123
Chloromethane	20.6	20.0	103	55 - 139
Cyclohexane	19.2	20.0	96	55 - 132
Dibromochloromethane	19.3	20.0	96	78 - 127
Dichlorodifluoromethane (CFC 12)	17.7	20.0	89	45 - 147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/18/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 309911

Lab Control Sample
RQ1210928-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	21.8	20.0	109	73 - 122
Ethylbenzene	20.3	20.0	102	75 - 123
Isopropylbenzene (Cumene)	21.8	20.0	109	75 - 139
Methyl Acetate	19.4	20.0	97	65 - 131
Methyl tert-Butyl Ether	22.5	20.0	113	75 - 116
Methylcyclohexane	19.5	20.0	98	59 - 127
Styrene	20.8	20.0	104	80 - 121
Tetrachloroethene (PCE)	18.5	20.0	92	71 - 127
Toluene	19.9	20.0	100	77 - 120
Trichloroethene (TCE)	19.1	20.0	96	75 - 122
Trichlorofluoromethane (CFC 11)	19.4	20.0	97	64 - 134
Vinyl Chloride	20.2	20.0	101	68 - 139
cis-1,2-Dichloroethene	22.3	20.0	112	77 - 123
cis-1,3-Dichloropropene	19.1	20.0	95	77 - 125
m,p-Xylenes	42.9	40.0	107	77 - 124
n-Butyl Acetate	17.9	20.0	90	61 - 126
o-Xylene	21.7	20.0	109	77 - 131
trans-1,2-Dichloroethene	22.2	20.0	111	72 - 120
trans-1,3-Dichloropropene	18.1	20.0	91	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126

Date Analyzed: 9/18/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Analytical Method: 8260C

Units: µg/L

Basis: NA

Analysis Lot: 309913

Lab Control Sample

RQ1210929-04

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.7	20.0	104	67 - 121
1,1,2,2-Tetrachloroethane	21.4	20.0	107	72 - 124
1,1,2-Trichloroethane	20.5	20.0	102	81 - 117
1,1,2-Trichloro-1,2,2-trifluoroethane	19.0	20.0	95	60 - 122
1,1-Dichloroethane (1,1-DCA)	23.9	20.0	119	76 - 124
1,1-Dichloroethene (1,1-DCE)	22.6	20.0	113	67 - 119
1,2,4-Trichlorobenzene	22.5	20.0	112	70 - 128
1,2-Dibromo-3-chloropropane (DBCP)	21.5	20.0	107	64 - 131
1,2-Dibromoethane	21.5	20.0	107	81 - 118
1,2-Dichlorobenzene	21.5	20.0	108	80 - 119
1,2-Dichloroethane	19.8	20.0	99	72 - 130
1,2-Dichloropropane	22.0	20.0	110	83 - 119
1,3-Dichlorobenzene	21.4	20.0	107	79 - 121
1,4-Dichlorobenzene	21.2	20.0	106	79 - 119
n-Butanol	826	1010	82	49 - 182
2-Butanone (MEK)	21.7	20.0	109	60 - 133
2-Hexanone	19.3	20.0	96	61 - 131
4-Methyl-2-pentanone	20.6	20.0	103	61 - 132
Acetone	22.0	20.0	110	64 - 133
Benzene	20.9	20.0	105	78 - 118
Bromodichloromethane	20.0	20.0	100	79 - 123
Bromoform	19.6	20.0	98	69 - 126
Bromomethane	21.9	20.0	109	49 - 124
Carbon Disulfide	23.1	20.0	115	67 - 138
Carbon Tetrachloride	20.3	20.0	102	64 - 129
Chlorobenzene	21.3	20.0	107	80 - 121
Chloroethane	21.9	20.0	110	72 - 130
Chloroform	21.9	20.0	109	75 - 123
Chloromethane	20.5	20.0	102	55 - 139
Cyclohexane	20.4	20.0	102	55 - 132
Dibromochloromethane	20.4	20.0	102	78 - 127
Dichlorodifluoromethane (CFC 12)	18.0	20.0	90	45 - 147

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/18/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS, Unpreserved**

Analytical Method: 8260C

Units: µg/L
Basis: NA

Analysis Lot: 309913

**Lab Control Sample
 RQ1210929-04**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Dichloromethane	22.6	20.0	113	73 - 122
Ethylbenzene	21.2	20.0	106	75 - 123
Isopropylbenzene (Cumene)	22.4	20.0	112	75 - 139
Methyl Acetate	20.0	20.0	100	65 - 131
Methyl tert-Butyl Ether	24.1	20.0	121 *	75 - 116
Methylcyclohexane	20.6	20.0	103	59 - 127
Styrene	22.1	20.0	110	80 - 121
Tetrachloroethene (PCE)	19.1	20.0	96	71 - 127
Toluene	20.8	20.0	104	77 - 120
Trichloroethene (TCE)	20.8	20.0	104	75 - 122
Trichlorofluoromethane (CFC 11)	19.8	20.0	99	64 - 134
Vinyl Chloride	21.2	20.0	106	68 - 139
cis-1,2-Dichloroethene	22.8	20.0	114	77 - 123
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125
m,p-Xylenes	44.3	40.0	111	77 - 124
n-Butyl Acetate	20.1	20.0	101	61 - 126
o-Xylene	22.5	20.0	112	77 - 131
trans-1,2-Dichloroethene	22.6	20.0	113	72 - 120
trans-1,3-Dichloropropene	18.9	20.0	94	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/19/12

Lab Control Sample Summary
Dissolved Gases by GC/FID

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 310243

Lab Control Sample
RQ1211017-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Ethane	28.8	26.0	111	82 - 127
Ethene	25.7	24.3	106	76 - 119
Methane	29.1	26.2	111	82 - 126

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP PED LC34 9/13/12
Sample Matrix: Water

Service Request: R1206126
Date Analyzed: 9/20/12

**Lab Control Sample Summary
Dissolved Gases by GC/FID**

Analytical Method: RSK 175

Units: µg/L

Basis: NA

Analysis Lot: 310244

Analyte Name	Lab Control Sample RQ1211018-02			Duplicate Lab Control Sample RQ1211018-03			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Ethane	26.3	26.0	101	31.1	26.0	119	82 - 127	17	30
Ethene	23.8	24.3	98	27.7	24.3	114	76 - 119	15	30
Methane	26.0	26.2	99	31.9	26.2	121	82 - 126	20	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daprato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix
LC34-BW0001A-024.5-201209	9-13-12	10:53	001	W
LC34-BW0001B-031.5-201209	9-13-12	11:13	002	W
LC34-BW0001C-038.5-201209	9-13-12	11:17	003	W
LC34-BW0001D-045.5-201209	9-13-12	12:13	004	W
LC34-BW0001E-052.5-201209	9-13-12	11:53	005	W
LC34-BW0001F-059.5-201209	9-13-12	11:53	006	W

Number of Containers	VOCs (8260C) plus n-butyl acetate	TOC (9060A)	MEEs (RSK 175)	REMARKS
9	3	3	3	
9	3	3	3	
9	3	3	3	
9	3	3	3	
9	3	3	3	
9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr 48 hr 5 BD
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B
 V. CLP
 EDDP: NASA KEDD

RELINQUISHED BY: David Szmor
 Signature: _____
 Printed Name: David Szmor
 Firm: Geosyntec
 Date/Time: 9/13/12 1700

RECEIVED BY: David Szmor
 Signature: _____
 Printed Name: David Szmor
 Firm: ALS
 Date/Time: 9/14/12 0930

R1206126
 Geosyntec Consultants
 ESTCP PED LC34 9/13/12



5

Comments/Special Instructions:

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 PH: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP FED LC34 Project Number: FO0552B
 Project Manager: Rebecca Daurato Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: _____

Sample I.D.	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260C) plus n-butyl acetate	TOC (9060A)	MEES (RSK 175)	REMARKS
LC34-BW0003A-024.5-201209	9-11-12	13:18		W	3	3	3	3	om
LC34-BW0003B-037.5-201209	9-11-12	13:45		W	3	3	3	3	ams
LC34-BW0003C-038.5-201209	9-13-12	08:35	001	W	9	3	3	3	
LC34-BW0003D-045.5-201209	9-13-12	10:08	002	W	9	3	3	3	
LC34-BW0003E-052.5-201209	9-13-12	09:58	003	W	9	3	3	3	
LC34-BW0003F-059.5-201209	9-15-12	09:10	004	W	9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____
 Invoice Information
 P.O. # _____
 Bill to: FO0552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup, MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-B _____
 V. CLP _____
 EDD?: NASA KEDD

RELINQUISHED BY:
 Signature: [Signature]
 Printed Name: David Simone
 Firm: Geosyntec
 Date/Time: 9/13/12 1700

RECEIVED BY:
 Signature: [Signature]
 Printed Name: FLD Rb
 Firm: _____
 Date/Time: 9/12/12 1700

R1200126

Columbia Analytical Services

1565 Jefferson Rd., Bldg. 300, Ste. 360, Rochester, NY 14623
 TEL: 585-288-5380 FAX: 585-288-8475

Project Name: ESTCP PED LC34 Project Number: FO9552B
 Project Manager: Rebecca Daurio Company: Geosyntec Consultants
 Company/Address: 6770 S. Washington Ave. Phone: 321-269-5880
 City, State, Zip: Titusville, FL 32780 FAX: 321-269-5813
 Sampler's Signature: _____

Sample ID	Date	Time	LAB ID	Matrix	Number of Containers	VOCs (8260) plus n-butyl acetate	TOC (906A)	MEEs (RSK 175)	REMARKS
LC34-RW0007-038.5-201209	9-13-12	09:31	0057911	W	9	3	3	3	
LC34-RW0008-052.0-201209	9-13-12	10:20	0058011/1412	W	9	3	3	3	
LC34-IW00021-027.5-201209	9-13-12	08:24	0057913	W	9	3	3	3	
LC34-IW0002D-037.5-201209	9-13-12	08:51	0058014	W	9	3	3	3	
LC34-IW0002D-052.5-201209	9-13-12	09:22	0058015	W	9	3	3	3	
LC34-IW00076-075.0-201209	9-13-12	11:07	0058016	W	9	3	3	3	

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 BD _____
 Standard (15 BD)
 Provide FAX Preliminary Results
 Requested Report Date: _____

INVOICE INFORMATION
 P.O. # _____
 Bill to: FO9552B

REPORT REQUIREMENTS
 I. Routine Report: Results and Method Blank (Surrogate, as required)
 II. Results w/ QC (Dup., MS, MSD as req)
 III. Results (with QC and Calibration Summaries)
 IV. ASP-R _____
 V. CLP _____
 EDDP: NASA KEDD

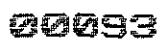
Comments/Special Instructions:
 R200126

RELINQUISHED BY:
 Signature: _____
 Printed Name: Bar. d. S. Remo
 Firm: Geosyntec
 Date/Time: 9/13/12 1700

RECEIVED BY:
 Signature: _____
 Printed Name: ASD
 Firm: _____
 Date/Time: 9/14/12 0930

RELINQUISHED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

RECEIVED BY:
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____





Cooler Receipt and Preservation Check Form

Project/Client Seoyates Folder Number R1201206

Cooler received on 9/14/12 by: AD COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES (NO)
- Were custody papers properly filled out (ink, signed, etc.)? (YES) NO
- Did all bottles arrive in good condition (unbroken)? (YES) NO
- Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? (YES) NO N/A
- Were Ice or Ice packs present? (YES) NO
- Where did the bottles originate? (ALS/ROC) CLIENT
- Temperature of cooler(s) upon receipt: 5.8 5.9°

Is the temperature within 0° - 6° C?: (Yes) (Yes) Yes Yes Yes

If No, Explain Below NO No No No No

Date/Time Temperatures Taken: 9/14/12 0940

Thermometer ID: (R GUN#3) / IR GUN#4 Reading From: Temp Blank / (Sample Bottle)

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location 2-012 by AD on 9/14/12 at 0945
5035 samples placed in storage location by on at

PC Secondary Review: KB 9/14/12

Cooler Breakdown: Date: 9/14/12 Time: 1649 by: AD

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? (YES) NO
- Did all bottle labels and tags agree with custody papers? (YES) NO
- Were correct containers used for the tests indicated? (YES) NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies: _____

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO ₃								
≤2	H ₂ SO ₄			<u>WC02071A</u>	<u>07/13</u>				
<4	NaHSO ₄								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	Na ₂ S ₂ O ₃	-	-						
	Zn Aceta	-	-						
	HCl	*	*	<u>4111100</u>	<u>07/13</u>				

Yes = All samples OK
No = Samples were preserved at lab as listed
PM OK to Adjust: _____

*Not to be tested before analysis - pH tested and recorded by VOAs or GenChem on a separate worksheet

Bottle lot numbers: 2-143-002, 2-143-001

Other Comments: Bubbles: 2W0070 (2 vials)
LC 348W0001 B (2 vials)
2W0007 (2 vials)

PC Secondary Review: KB 10/1/12
H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm, WC > 1 in. diameter

Certificate of Analysis: Gene-Trac® *Dehalococcoides* Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2609

Project: LC34

Report Date: 1-Oct-12

Customer Reference: FO0552B

Data Files: iQ5-GBA-QPCR-0033
MyiQ-DHC-QPCR-0937
MyiQ-DB-DHC-QPCR-0314

Table 1a: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc *	<i>Dehalococcoides</i> Enumeration/Liter **
LC34-RW0007-038.5-20120913	DHC-8560	13-Sep-12	Groundwater	1 - 3 %	2 x 10 ⁷
LC34-BW0001C-038.5-20120913	DHC-8561	13-Sep-12	Groundwater	9 - 24 %	1 x 10 ⁸
LC34-BW0003C-038.5-20120913	DHC-8562	13-Sep-12	Groundwater	12 - 31 %	1 x 10 ⁸
LC34-RW0008-052.0-20120913	DHC-8563	13-Sep-12	Groundwater	3 - 10 %	6 x 10 ⁷
LC34-BW0001E-052.5-20120913	DHC-8564	13-Sep-12	Groundwater	1 - 4 %	2 x 10 ⁷
LC34-BW0003E-052.5-20120913	DHC-8565	13-Sep-12	Groundwater	0.3 - 0.8 %	2 x 10 ⁶

Notes:

* Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample. Range represents normal variation in Dhc enumeration.

** Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.


B Analyte was also detected in the method blank.

NA Not applicable as *Dehalococcoides* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

E Extracted genomic DNA was not detected in sample.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Approved: 
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Certificate of Analysis: Gene-Trac® *Dehalococcoides* Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2609

Project: LC34

Report Date: 1-Oct-12

Customer Reference: FO0552B

Data Files: iQ5-GBA-QPCR-0033
MyiQ-DHC-QPCR-0937
MyiQ-DB-DHC-QPCR-0314

Table 1b: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent Dhc *	<i>Dehalococcoides</i> Enumeration/Gram **
LC34-DPT0349-043.5-20120910	DHC-8566	10-Sep-12	Soil	0.0002 - 0.0005 %	2 x 10 ³ J
LC34-DPT0349-048.0-20120910	DHC-8567	10-Sep-12	Soil	0.0002 - 0.0005 %	3 x 10 ³ J
LC34-DPT0350-037.0-20120910	DHC-8568	10-Sep-12	Soil	0.0002 - 0.0007 %	4 x 10 ³ J
LC34-DPT0350-047.0-20120910	DHC-8569	10-Sep-12	Soil	NA	7 x 10 ⁵ U, I
LC34-DPT0350-050.0-20120910	DHC-8570	10-Sep-12	Soil	0.08 - 0.2 %	1 x 10 ⁶
LC34-DPT0351-045.0-20120911	DHC-8571	11-Sep-12	Soil	0.04 - 0.1 %	7 x 10 ⁵
LC34-DPT0351-047.0-20120911	DHC-8572	11-Sep-12	Soil	NA	8 x 10 ³ U, I
LC34-DPT0351-048.5-20120911	DHC-8573	11-Sep-12	Soil	0.002 - 0.007 %	3 x 10 ⁴

Notes:

* Percent *Dehalococcoides* (Dhc) in microbial population. This value is calculated by dividing the number of Dhc 16S ribosomal ribonucleic acid (rRNA) gene copies by the total number of bacteria as estimated by the mass of DNA extracted from the sample. Range represents normal variation in Dhc enumeration.

** Based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the sample.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *Dehalococcoides* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

E Extracted genomic DNA was not detected in sample.


Analyst: _____
Kela Bartle, B.Sc.
Laboratory Technician


Approved: _____
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Certificate of Analysis: Gene-Trac® VC, Vinyl Chloride Reductase (vcrA) Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2609

Project: LC34

Report Date: 1-Oct-12

Customer Reference: FO0552B

Data Files: MyiQ-DB-VC-QPCR-0235
MyiQ-VC-QPCR-0501
VC-QPCR-check-gel-0521

Table 1c: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent <i>vcrA</i> *	Vinyl Chloride Reductase (<i>vcrA</i>) Gene Copies/Liter
LC34-RW0007-038.5-20120913	VCR-3399	13-Sep-12	Groundwater	0.6 - 2 %	1 x 10 ⁷
LC34-BW0001C-038.5-20120913	VCR-3400	13-Sep-12	Groundwater	15 - 38 %	2 x 10 ⁸
LC34-BW0003C-038.5-20120913	VCR-3401	13-Sep-12	Groundwater	10 - 27 %	1 x 10 ⁸
LC34-RW0008-052.0-20120913	VCR-3402	13-Sep-12	Groundwater	3 - 10 %	6 x 10 ⁷
LC34-BW0001E-052.5-20120913	VCR-3403	13-Sep-12	Groundwater	3 - 8 %	3 x 10 ⁷
LC34-BW0003E-052.5-20120913	VCR-3404	13-Sep-12	Groundwater	0.7 - 2 %	5 x 10 ⁶

Notes:

* Percentage of bacteria in the microbial population that harbor the *vcrA* gene. This value is calculated by dividing the measured number of cells harboring the vinyl chloride reductase A (*vcrA*) gene by the total number of bacteria in the sample estimated using the mass of DNA extracted from the sample. Range represents normal variation in enumeration of *vcrA*.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.


B Analyte was also detected in the method blank.

NA Not applicable as *vcrA* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

C Correction factor applied to correct for non-specific PCR amplification products.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician

Approved: 
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Certificate of Analysis: Gene-Trac® VC, Vinyl Chloride Reductase (vcrA) Assay

Customer: Rebecca Daprato, Geosyntec Consultants

SiREM Reference: S-2609

Project: LC34

Report Date: 1-Oct-12

Customer Reference: FO0552B

Data Files: MyiQ-DB-VC-QPCR-0235
MyiQ-VC-QPCR-0501
VC-QPCR-check-gel-0521

Table 1d: Test Results

Customer Sample ID	SiREM Sample ID	Sample Collection Date	Sample Matrix	Percent <i>vcrA</i> *	Vinyl Chloride Reductase (<i>vcrA</i>) Gene Copies/Gram
LC34-DPT0349-043.5-20120910	VCR-3405	10-Sep-12	Soil	NA	6 x 10 ³ U
LC34-DPT0349-048.0-20120910	VCR-3406	10-Sep-12	Soil	NA	7 x 10 ³ U
LC34-DPT0350-037.0-20120910	VCR-3407	10-Sep-12	Soil	NA	6 x 10 ³ U
LC34-DPT0350-050.0-20120910	VCR-3408	10-Sep-12	Soil	0.1 - 0.3 %	1 x 10 ⁶
LC34-DPT0351-045.0-20120911	VCR-3409	11-Sep-12	Soil	0.06 - 0.2 %	1 x 10 ⁶
LC34-DPT0351-048.5-20120911	VCR-3410	11-Sep-12	Soil	0.004 - 0.01 %	6 x 10 ⁴

Notes:

* Percentage of bacteria in the microbial population that harbor the *vcrA* gene. This value is calculated by dividing the measured number of cells harboring the vinyl chloride reductase A (*vcrA*) gene by the total number of bacteria in the sample estimated using the mass of DNA extracted from the sample. Range represents normal variation in enumeration of *vcrA*.

J The associated value is an estimated quantity between the method detection limit and quantitation limit.


U Not detected, associated value is the quantification limit.

B Analyte was also detected in the method blank.

NA Not applicable as *vcrA* not detected and/or quantifiable DNA not extracted from the sample.

I Sample inhibited the test reaction based on inability to PCR amplify extracted DNA with universal primers.

C Correction factor applied to correct for non-specific PCR amplification products.

Analyst: 
Kela Bartle, B.Sc.
Laboratory Technician


Approved: 
Ximena Druar, B.Sc.
Genetic Testing Coordinator

Table 2.1: Detailed Test Parameters, Gene-Trac Test Reference S-2609

Customer Sample ID	LC34-RW0007-038.5-20120913	LC34-BW0001C-038.5-20120913	LC34-BW0003C-038.5-20120913
SiREM Dhc Sample ID	DHC-8560	DHC-8561	DHC-8562
SiREM <i>vcrA</i> Sample ID	VCR-3399	VCR-3400	VCR-3401
Date Received	17-Sep-12	17-Sep-12	17-Sep-12
Sample Temperature	6 °C	6 °C	6 °C
Filtration Date	18-Sep-12	18-Sep-12	18-Sep-12
Volume Used for DNA Extraction	500 mL	500 mL	500 mL
DNA Extraction Date	25-Sep-12	25-Sep-12	25-Sep-12
DNA Concentration in Sample (extractable)	3692 ng/L	2261 ng/L	1820 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
Dhc qPCR Date Analyzed	26-Sep-12	26-Sep-12	26-Sep-12
<i>vcrA</i> qPCR Date Analyzed	27-Sep-12	27-Sep-12	27-Sep-12
Laboratory Controls (see Tables 3 & 4)	Passed	Passed	Passed
Comments	--	--	--

Notes:

Refer to Tables 3 & 4 for detailed results of controls.
vcrA = vinyl chloride reductase
 °C = degrees Celsius

PCR = polymerase chain reaction
 qPCR = quantitative PCR
 Dhc = Dehalococcoides

ng/L = nanograms per liter
 mL = milliliters
 DNA = Deoxyribonucleic acid

Table 2.2: Detailed Test Parameters, Gene-Trac Test Reference S-2609

Customer Sample ID	LC34-RW0008-052.0-20120913	LC34-BW0001E-052.5-20120913	LC34-BW0003E-052.5-20120913
SiREM Dhc Sample ID	DHC-8563	DHC-8564	DHC-8565
SiREM <i>vcrA</i> Sample ID	VCR-3402	VCR-3403	VCR-3404
Date Received	17-Sep-12	17-Sep-12	17-Sep-12
Sample Temperature	6 °C	6 °C	6 °C
Filtration Date	18-Sep-12	18-Sep-12	18-Sep-12
Volume Used for DNA Extraction	500 mL	500 mL	500 mL
DNA Extraction Date	25-Sep-12	25-Sep-12	25-Sep-12
DNA Concentration in Sample (extractable)	3491 ng/L	1986 ng/L	1485 ng/L
PCR Amplifiable DNA	Detected	Detected	Detected
Dhc qPCR Date Analyzed	26-Sep-12	26-Sep-12	26-Sep-12
<i>vcrA</i> qPCR Date Analyzed	27-Sep-12	27-Sep-12	27-Sep-12
Laboratory Controls (see Tables 3 & 4)	Passed	Passed	Passed
Comments	--	--	--

Notes:

Refer to Tables 3 & 4 for detailed results of controls.
vcrA = vinyl chloride reductase
 °C = degrees Celsius

PCR = polymerase chain reaction
 qPCR = quantitative PCR
 Dhc = Dehalococcoides

ng/L = nanograms per liter
 mL = milliliters
 DNA = Deoxyribonucleic acid

Table 2.3: Detailed Test Parameters, Gene-Trac Test Reference S-2609

Customer Sample ID	LC34-DPT0349-043.5-20120910	LC34-DPT0349-048.0-20120910	LC34-DPT0350-037.0-20120910	LC34-DPT0350-047.0-20120910
SiREM Dhc Sample ID	DHC-8566	DHC-8567	DHC-8568	DHC-8569
SiREM <i>vcrA</i> Sample ID	VCR-3405	VCR-3406	VCR-3407	NA
Date Received	17-Sep-12	17-Sep-12	17-Sep-12	17-Sep-12
Sample Temperature	6 °C	6 °C	6 °C	6 °C
Filtration Date	NA	NA	NA	NA
Weight Used for DNA Extraction	0.22 g	0.18 g	0.20 g	0.18 g
DNA Extraction Date	25-Sep-12	25-Sep-12	25-Sep-12	25-Sep-12
DNA Concentration in Sample (extractable)	2552 ng/g	3015 ng/g	2901 ng/g	2747 ng/g
PCR Amplifiable DNA	Detected	Detected	Detected	ND
Dhc qPCR Date Analyzed	26-Sep-12	26-Sep-12	26-Sep-12	26-Sep-12
<i>vcrA</i> qPCR Date Analyzed	27-Sep-12	27-Sep-12	27-Sep-12	NA
Laboratory Controls (see Tables 3 & 4)	Passed	Passed	Passed	Passed
Comments	--	--	--	Sample not tested for <i>vcrA</i> as it was ND for Dhc.

Notes:

Refer to Tables 3 & 4 for detailed results of controls.

NA - not applicable

ND = not detected

°C = degrees Celsius

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = Dehalococcoides

vcrA = vinyl chloride reductase

ng/g = nanograms per gram

g = gram

DNA = Deoxyribonucleic acid

Table 2.4: Detailed Test Parameters, Gene-Trac Test Reference S-2609

Customer Sample ID	LC34-DPT0350-050.0-20120910	LC34-DPT0351-045.0-20120911	LC34-DPT0351-047.0-20120911	LC34-DPT0351-048.5-20120911
SiREM Dhc Sample ID	DHC-8570	DHC-8571	DHC-8572	DHC-8573
SiREM <i>vcrA</i> Sample ID	VCR-3408	VCR-3409	NA	VCR-3410
Date Received	17-Sep-12	17-Sep-12	17-Sep-12	17-Sep-12
Sample Temperature	6 °C	6 °C	6 °C	6 °C
Filtration Date	NA	NA	NA	NA
Weight Used for DNA Extraction	0.25 g	0.19 g	0.15 g	0.20 g
DNA Extraction Date	25-Sep-12	25-Sep-12	25-Sep-12	25-Sep-12
DNA Concentration in Sample (extractable)	2498 ng/g	3656 ng/g	3881 ng/g	2796 ng/g
PCR Amplifiable DNA	Detected	Detected	ND	Detected
Dhc qPCR Date Analyzed	26-Sep-12	26-Sep-12	26-Sep-12	26-Sep-12
<i>vcrA</i> qPCR Date Analyzed	27-Sep-12	27-Sep-12	NA	27-Sep-12
Laboratory Controls (see Tables 3 & 4)	Passed	Passed	Passed	Passed
Comments	--	--	Sample not tested for <i>vcrA</i> as it was ND for Dhc.	--

Notes:

Refer to Tables 3 & 4 for detailed results of controls.

NA - not applicable

ND = not detected

°C = degrees Celsius

PCR = polymerase chain reaction

qPCR = quantitative PCR

Dhc = Dehalococcoides

vcrA = vinyl chloride reductase

ng/g = nanograms per gram

g = gram

DNA = Deoxyribonucleic acid

Table 3: Experimental Control Results, Gene-Trac Test Reference S-2609

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Liter	Recovered Dhc 16S rRNA Gene Copies per Liter	Comments
Positive Control Low Concentration	26-Sep-12	qPCR with KB1 genomic DNA (CSLD-0574)	1.4×10^5	1.2×10^5	--
Positive Control High Concentration	26-Sep-12	qPCR with KB1 genomic DNA (CSHD-0574)	1.8×10^7	1.4×10^7	--
DNA Extraction Blank	26-Sep-12	DNA extraction sterile water (FB-1761)	0	1.0×10^3 J	See Note 1
Negative Control	26-Sep-12	Tris Reagent Blank (TBD-0534)	0	2.6×10^3 U	--

Laboratory Control	Analysis Date	Control Description	Spiked Dhc 16S rRNA Gene Copies per Gram	Recovered Dhc 16S rRNA Gene Copies per Gram	Comments
Positive Control Low Concentration	26-Sep-12	qPCR with KB1 genomic DNA (CSLD-0574)	2.7×10^5	2.4×10^5	--
Positive Control High Concentration	26-Sep-12	qPCR with KB1 genomic DNA (CSHD-0574)	3.6×10^7	2.7×10^7	--
DNA Extraction Blank	26-Sep-12	DNA extraction sterile water (EB-1762)	0	5.2×10^3 U	--
Negative Control	26-Sep-12	Tris Reagent Blank (TBD-0534)	0	5.2×10^3 U	--

Notes:

Dhc = *Dehalococcoides*

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR

16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.

¹Acceptable as test results for relevant samples are greater than 1 order of magnitude above DNA Extraction Blank test result.

Table 4: Experimental Control Results, Gene-Trac Test Reference S-2609

Laboratory Control	Analysis Date	Control Description	Spiked <i>vcrA</i> reductase Gene Copies per Liter	Recovered <i>vcrA</i> reductase Gene Copies per Liter	Comments
Positive Control Low Concentration	27-Sep-12	qPCR with KB1 genomic DNA (CSLV-0369)	3.2×10^5	3.3×10^5	--
Positive Control High Concentration	27-Sep-12	qPCR with KB1 genomic DNA (CSHV-0369)	3.6×10^7	4.3×10^7	--
DNA Extraction Blank	27-Sep-12	DNA extraction sterile water (FB-1761)	0	2.6×10^3 U	--
Negative Control	27-Sep-12	Tris Reagent Blank (TBV-0340)	0	2.6×10^3 U	--

Laboratory Control	Analysis Date	Control Description	Spiked <i>vcrA</i> reductase Gene Copies per Gram	Recovered <i>vcrA</i> reductase Gene Copies per Gram	Comments
Positive Control Low Concentration	27-Sep-12	qPCR with KB1 genomic DNA (CSLV-0369)	6.4×10^5	6.5×10^5	--
Positive Control High Concentration	27-Sep-12	qPCR with KB1 genomic DNA (CSHV-0369)	7.2×10^7	8.5×10^7	--
DNA Extraction Blank	27-Sep-12	DNA extraction sterile water (EB-1762)	0	5.2×10^3 U	--
Negative Control	27-Sep-12	Tris Reagent Blank (TBV-0340)	0	5.2×10^3 U	--

Notes:

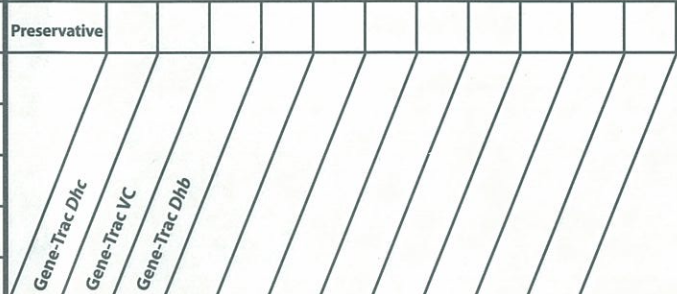

DNA = Deoxyribonucleic acid

qPCR = quantitative PCR



16S rRNA = 16S ribosomal ribonucleic acid

U Not detected, associated value is the quantification limit.

vcrA = vinyl chloride reductase

Project Name LC34		Project # FO0552B		Analysis															
Project Manager Rebecca Daprato				Preservative															
Email Address rdaprato@Geosyntec.com																Preservative Key			
Company Geosyntec																0. None			
Address Titusville, FL																1. HCl			
Phone # 321 2695880																2. Other _____			
Fax # _____																3. Other _____			
Sampler's Signature 		Sampler's Printed Name A David Siremore		Other Information															
Customer Sample ID		Sampling														Matrix		# of Containers	
		Date														Time			
LC34-RW0007-038.5-20120913		9/13/12														951			
LC34-BW001C-038.5-20120913		↓														1020		1127	
LC34-BW0003C-038.5-20120913		↓														835			
LC34-RW0008-052-0-20120913		↓														1020			
LC34-BW0001E-052.5-20120913		↓		1153															
LC34-BW0003E-052.5-20120913		↓		938															

Cooler Condition: Sample Receipt GOOD		P.O. #		Turnaround Time Requested		For Lab Use Only	
Cooler Temperature: 6°C		Billing Information		Normal <input type="checkbox"/>			
Custody Seals: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		Bill To:		Rush <input type="checkbox"/>			
						Proposal #: _____	

Relinquished By: Signature 		Received By: Signature FED EX		Relinquished By: Signature 		Received By: Signature D. Nespoli		Relinquished By: Signature _____		Received By: Signature _____	
Printed Name DAVID SIREMORE		Printed Name FED EX		Printed Name D. Nespoli		Printed Name _____		Printed Name _____		Printed Name _____	
Firm Geosyntec		Firm _____		Firm SiREM		Firm _____		Firm _____		Firm _____	
Date/Time 9/13/12 1700		Date/Time 9/13/12 1700		Date/Time Sept 17 '12 1:50pm		Date/Time _____		Date/Time _____		Date/Time _____	



September 27, 2012

Service Request No: R1206036

Dr. Rebecca Daprato
GeoSyntec Consultants
11490 Westheimer
Suite 150
Houston, TX 77077

Laboratory Results for: ESTCP LC34 FO 0552B

Dear Dr. Daprato:

Enclosed are the results of the sample(s) submitted to our laboratory on September 12, 2012. For your reference, these analyses have been assigned our service request number **R1206036**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

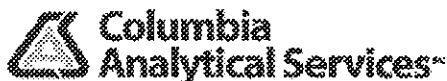
Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

Columbia Analytical Services, Inc. dba ALS Environmental

Karen Bunker
Project Manager

Page 1 of 96



ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623

PHONE 585-288-5380 | FAX 585-288-8475

Columbia Analytical Services, Inc.

Part of the ALS Group A Campbell Brothers Limited Company

Client: Geosyntec Consultants
Project: ESTCP PED LC34/ TR0272 2/13/12
Sample Matrix: Soil

Service Request No.: R1206036
Date Received: 9/12/12

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses.

Sample Receipt

Twenty-two (22) soil samples were collected by the client on 9/10-11/12 in Terracore samplers and were received for analysis at Columbia Analytical Services on 9/12/12 via a national courier. The samples were received at a cooler temperature of 2.7°C within the guidelines of 0-6°C. Sample locations LC34-DPT0351-053.0-20120911 (CAS # R1206036-011), LC34-DPT0349-040.0-20120910 (R1206036-013), and LC34-DPT0349-046.5-20120910 (R1206036-016) arrived with liquid in the sample bags indicating possible leakage. However, all samples were able to be screened and analyzed.

Organic Compounds

Twenty-two (22) water samples were analyzed for a client specific list of Volatile Organics by Method 8260C. All soils were analyzed for % Solids in order to report all data on a dry weight basis.

Initial Calibration Criteria was met for all samples for 8260C. The Continuing Calibration Verification (CCV) standard exceeded 20% Difference criteria for Bromomethane and Chloromethane on the 9/14/12 and 9/19/12 analytical runs and Acetone on the 9/20/12. All detected concentrations for these compound in samples associated with these CCV's should be considered as estimated.

All surrogate recoveries were within acceptance limits.

Batch QC is included in the report. The Laboratory Control Samples (LCS) and LCS Duplicates (LCS D for Organic Acids only) recoveries were all within QC limits. All Relative Percent Difference (RPD) calculations were acceptable.

Samples required dilutions in order to bring hits within the calibration range of the standards. For samples with hits above the range, the sample is then repeated at the appropriate dilution for the hit. The sample data is merged and reported with the initial surrogate recoveries as per client requirements for this project.

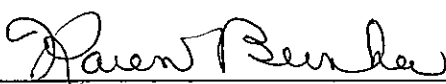
All samples were analyzed within the proper holding time for the method.

Hits between the Minimum Detection Limit (MDL) and Method Reporting Limit (MRL) are flagged as "I", estimated.

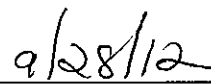
The Laboratory Method Blanks were free from contamination except for a low level hit for Bromomethan on the 9/19/12 method blank. Any affected sample hits would be flagged as "V".

No other analytical or QC problems were encountered.

Approved by



Date



CASE NARRATIVE

This report contains analytical results for the following samples:

Service Request Number: R1206036

<u>Lab ID</u>	<u>Client ID</u>
R1206036-001	LC34-DPT0350-047.0-20120910
R1206036-002	LC34-DPT0350-048.5-20120910
R1206036-003	LC34-DPT0350-053.0-20120910
R1206036-004	LC34-DPT0351-034.5-20120910
R1206036-005	LC34-DPT0351-037.0-20120910
R1206036-006	LC34-DPT0351-040.0-20120910
R1206036-007	LC34-DPT0349-047.0-20120910
R1206036-008	LC34-DPT0351-045.5-20120911
R1206036-009	LC34-DPT0351-047.0-20120911
R1206036-010	LC34-DPT0351-048.5-20120911
R1206036-011	LC34-DPT0351-053.0-20120910
R1206036-012	LC34-DPT0349-037.0-20120910
R1206036-013	LC34-DPT0349-040.0-20120910
R1206036-014	LC34-DPT0349-043.5-20120910
R1206036-015	LC34-DPT0349-045.0-20120910
R1206036-016	LC34-DPT0349-046.5-20120910
R1206036-017	LC34-DPT0349-048.0-20120910
R1206036-018	LC34-DPT0349-053.0-20120910
R1206036-019	LC34-DPT0350-037.0-20120910
R1206036-020	LC34-DPT0350-040.0-20120910
R1206036-021	LC34-DPT0350-044.0-20120910
R1206036-022	LC34-DPT0350-045.5-20120910

Florida DEP Data Qualifiers

- B Results based upon colony counts outside the acceptable range.
- D Measurement was made in the field.
- H Value based on field kit determination; results may not be accurate.
- i The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J Estimated value (one of the following reasons is discussed in the project case narrative).
1. The result may be inaccurate because the surrogate recovery limits have been exceeded.
 2. No known quality control criteria exists for the component.
 3. The reported value failed to meet the established quality control criteria for either precision or accuracy.
 4. The sample matrix interfered with the ability to make any accurate determination (e.g., primary and confirmation results show greater than 40% RPD).
 5. The data is questionable because of improper laboratory or field protocols (e.g., GC/MS Tune did not meet method criteria).
- K Off scale low. The value is less than the lowest calibration standard but greater than the method reporting limit (MRL).
- L Off scale high. The analyte is above the upper limit of the linear calibration range.
- M The MDL/MRL has been elevated because the analyte could not be accurately quantified due to matrix interference.
- N Presumptive evidence of the analyte. Confirmation was not performed.
- Q Sample held beyond the accepted holding time.
- T Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only.
- U Indicates that the compound was analyzed for but not detected.
- V Indicates that the analyte was detected in both the sample and the associated method blank.
- Y The laboratory analysis was from an improperly preserved sample.
- Z Too many colonies were present (TNTC). The numeric value represents the filtration volume.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-047.0-20120910
Lab Code: R1206036-001

Service Request: R1206036
Date Collected: 9/10/12 1450
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.1	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-047.0-20120910
Lab Code: R1206036-001

Service Request: R1206036
Date Collected: 9/10/12 1450
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 70.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	1400	U	1400	110	200	NA	9/14/12 23:32		309582	
1,1,2,2-Tetrachloroethane	1400	U	1400	58	200	NA	9/14/12 23:32		309582	
1,1,2-Trichloroethane	1400	U	1400	120	200	NA	9/14/12 23:32		309582	
1,1-Dichloroethane (1,1-DCA)	1400	U	1400	89	200	NA	9/14/12 23:32		309582	
1,1-Dichloroethene (1,1-DCE)	1400	U	1400	160	200	NA	9/14/12 23:32		309582	
1,2-Dichloroethane	1400	U	1400	92	200	NA	9/14/12 23:32		309582	
1,2-Dichloropropane	1400	U	1400	110	200	NA	9/14/12 23:32		309582	
n-Butanol	71000	U	71000	15000	200	NA	9/14/12 23:32		309582	
2-Butanone (MEK)	1400	U	1400	440	200	NA	9/14/12 23:32		309582	
2-Hexanone	1400	U	1400	170	200	NA	9/14/12 23:32		309582	
4-Methyl-2-pentanone	1400	U	1400	150	200	NA	9/14/12 23:32		309582	
Acetone	1400	U	1400	320	200	NA	9/14/12 23:32		309582	
Benzene	1400	U	1400	78	200	NA	9/14/12 23:32		309582	
Bromodichloromethane	1400	U	1400	72	200	NA	9/14/12 23:32		309582	
Bromoform	1400	U	1400	190	200	NA	9/14/12 23:32		309582	
Bromomethane	160	I	1400	130	200	NA	9/14/12 23:32		309582	
Carbon Disulfide	1400	U	1400	86	200	NA	9/14/12 23:32		309582	
Carbon Tetrachloride	1400	U	1400	75	200	NA	9/14/12 23:32		309582	
Chlorobenzene	1400	U	1400	80	200	NA	9/14/12 23:32		309582	
Chloroethane	1400	U	1400	110	200	NA	9/14/12 23:32		309582	
Chloroform	1400	U	1400	130	200	NA	9/14/12 23:32		309582	
Chloromethane	1400	U	1400	140	200	NA	9/14/12 23:32		309582	
Dibromochloromethane	1400	U	1400	66	200	NA	9/14/12 23:32		309582	
Dichloromethane	1400	U	1400	140	200	NA	9/14/12 23:32		309582	
Ethylbenzene	1400	U	1400	89	200	NA	9/14/12 23:32		309582	
Styrene	1400	U	1400	58	200	NA	9/14/12 23:32		309582	
Tetrachloroethene (PCE)	1400	U	1400	58	200	NA	9/14/12 23:32		309582	
Toluene	1400	U	1400	98	200	NA	9/14/12 23:32		309582	
Trichloroethene (TCE)	48000		1400	58	200	NA	9/14/12 23:32		309582	
Vinyl Chloride	1400	U	1400	92	200	NA	9/14/12 23:32		309582	
cis-1,2-Dichloroethene	5100		1400	72	200	NA	9/14/12 23:32		309582	
cis-1,3-Dichloropropene	1400	U	1400	75	200	NA	9/14/12 23:32		309582	
m,p-Xylenes	2900	U	2900	160	200	NA	9/14/12 23:32		309582	
n-Butyl Acetate	1400	U	1400	66	200	NA	9/14/12 23:32		309582	
o-Xylene	1400	U	1400	83	200	NA	9/14/12 23:32		309582	
trans-1,2-Dichloroethene	1400	U	1400	110	200	NA	9/14/12 23:32		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

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Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-047.0-20120910
Lab Code: R1206036-001

Service Request: R1206036
Date Collected: 9/10/12 1450
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 70.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1400 U	1400	69	200	NA	9/14/12 23:32		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 23:32	
Dibromofluoromethane	103	89-119	9/14/12 23:32	
Toluene-d8	99	87-121	9/14/12 23:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-048.5-20120910
Lab Code: R1206036-002

Service Request: R1206036
Date Collected: 9/10/12 1506
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	68.4	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-048.5-20120910
Lab Code: R1206036-002

Service Request: R1206036
Date Collected: 9/10/12 1506
Date Received: 9/12/12

Units: µg/Kg
Basis: Dry
Percent Solids: 68.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1500	U	1500	120	199	NA	9/15/12 00:05		309582	
1,1,2,2-Tetrachloroethane	1500	U	1500	59	199	NA	9/15/12 00:05		309582	
1,1,2-Trichloroethane	1500	U	1500	120	199	NA	9/15/12 00:05		309582	
1,1-Dichloroethane (1,1-DCA)	1500	U	1500	91	199	NA	9/15/12 00:05		309582	
1,1-Dichloroethene (1,1-DCE)	1500	U	1500	160	199	NA	9/15/12 00:05		309582	
1,2-Dichloroethane	1500	U	1500	94	199	NA	9/15/12 00:05		309582	
1,2-Dichloropropane	1500	U	1500	120	199	NA	9/15/12 00:05		309582	
n-Butanol	73000	U	73000	15000	199	NA	9/15/12 00:05		309582	
2-Butanone (MEK)	1500	U	1500	450	199	NA	9/15/12 00:05		309582	
2-Hexanone	1500	U	1500	170	199	NA	9/15/12 00:05		309582	
4-Methyl-2-pentanone	1500	U	1500	150	199	NA	9/15/12 00:05		309582	
Acetone	1500	U	1500	320	199	NA	9/15/12 00:05		309582	
Benzene	1500	U	1500	79	199	NA	9/15/12 00:05		309582	
Bromodichloromethane	1500	U	1500	73	199	NA	9/15/12 00:05		309582	
Bromoform	1500	U	1500	190	199	NA	9/15/12 00:05		309582	
Bromomethane	1500	U	1500	140	199	NA	9/15/12 00:05		309582	
Carbon Disulfide	1500	U	1500	88	199	NA	9/15/12 00:05		309582	
Carbon Tetrachloride	1500	U	1500	76	199	NA	9/15/12 00:05		309582	
Chlorobenzene	1500	U	1500	82	199	NA	9/15/12 00:05		309582	
Chloroethane	1500	U	1500	120	199	NA	9/15/12 00:05		309582	
Chloroform	1500	U	1500	130	199	NA	9/15/12 00:05		309582	
Chloromethane	1500	U	1500	140	199	NA	9/15/12 00:05		309582	
Dibromochloromethane	1500	U	1500	67	199	NA	9/15/12 00:05		309582	
Dichloromethane	1500	U	1500	140	199	NA	9/15/12 00:05		309582	
Ethylbenzene	1500	U	1500	91	199	NA	9/15/12 00:05		309582	
Styrene	1500	U	1500	59	199	NA	9/15/12 00:05		309582	
Tetrachloroethene (PCE)	1500	U	1500	59	199	NA	9/15/12 00:05		309582	
Toluene	1500	U	1500	99	199	NA	9/15/12 00:05		309582	
Trichloroethene (TCE)	38000		1500	59	199	NA	9/15/12 00:05		309582	
Vinyl Chloride	1500	U	1500	94	199	NA	9/15/12 00:05		309582	
cis-1,2-Dichloroethene	4700		1500	73	199	NA	9/15/12 00:05		309582	
cis-1,3-Dichloropropene	1500	U	1500	76	199	NA	9/15/12 00:05		309582	
m,p-Xylenes	2900	U	2900	160	199	NA	9/15/12 00:05		309582	
n-Butyl Acetate	1500	U	1500	67	199	NA	9/15/12 00:05		309582	
o-Xylene	1500	U	1500	85	199	NA	9/15/12 00:05		309582	
trans-1,2-Dichloroethene	1500	U	1500	120	199	NA	9/15/12 00:05		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-048.5-20120910
Lab Code: R1206036-002

Service Request: R1206036
Date Collected: 9/10/12 1506
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 68.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1500 U	1500	70	199	NA	9/15/12 00:05		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/15/12 00:05	
Dibromofluoromethane	101	89-119	9/15/12 00:05	
Toluene-d8	99	87-121	9/15/12 00:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-053.0-20120910
Lab Code: R1206036-003

Service Request: R1206036
Date Collected: 9/10/12 1643
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	69.8	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-053.0-20120910
Lab Code: R1206036-003

Service Request: R1206036
Date Collected: 9/10/12 1643
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 69.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.5 U	5.5	0.81	.77	NA	9/20/12 19:13		310427	
1,1,2,2-Tetrachloroethane	5.5 U	5.5	0.90	.77	NA	9/20/12 19:13		310427	
1,1,2-Trichloroethane	5.5 U	5.5	0.81	.77	NA	9/20/12 19:13		310427	
1,1-Dichloroethane (1,1-DCA)	5.5 U	5.5	1.4	.77	NA	9/20/12 19:13		310427	
1,1-Dichloroethene (1,1-DCE)	5.5 U	5.5	1.5	.77	NA	9/20/12 19:13		310427	
1,2-Dichloroethane	5.5 U	5.5	0.68	.77	NA	9/20/12 19:13		310427	
1,2-Dichloropropane	5.5 U	5.5	1.1	.77	NA	9/20/12 19:13		310427	
n-Butanol	280 U	280	58	.77	NA	9/20/12 19:13		310427	
2-Butanone (MEK)	3.0 I	5.5	2.6	.77	NA	9/20/12 19:13		310427	
2-Hexanone	5.5 U	5.5	1.4	.77	NA	9/20/12 19:13		310427	
4-Methyl-2-pentanone	5.5 U	5.5	1.1	.77	NA	9/20/12 19:13		310427	
Acetone	27	5.5	3.1	.77	NA	9/20/12 19:13		310427	
Benzene	5.5 U	5.5	0.32	.77	NA	9/20/12 19:13		310427	
Bromodichloromethane	5.5 U	5.5	0.68	.77	NA	9/20/12 19:13		310427	
Bromoform	5.5 U	5.5	1.1	.77	NA	9/20/12 19:13		310427	
Bromomethane	5.5 U	5.5	1.6	.77	NA	9/20/12 19:13		310427	
Carbon Disulfide	21	5.5	1.4	.77	NA	9/20/12 19:13		310427	
Carbon Tetrachloride	5.5 U	5.5	1.1	.77	NA	9/20/12 19:13		310427	
Chlorobenzene	5.5 U	5.5	0.32	.77	NA	9/20/12 19:13		310427	
Chloroethane	5.5 U	5.5	3.2	.77	NA	9/20/12 19:13		310427	
Chloroform	5.5 U	5.5	1.4	.77	NA	9/20/12 19:13		310427	
Chloromethane	5.5 U	5.5	0.45	.77	NA	9/20/12 19:13		310427	
Dibromochloromethane	5.5 U	5.5	0.81	.77	NA	9/20/12 19:13		310427	
Dichloromethane	5.5 U	5.5	0.63	.77	NA	9/20/12 19:13		310427	
Ethylbenzene	5.5 U	5.5	0.26	.77	NA	9/20/12 19:13		310427	
Styrene	5.5 U	5.5	0.34	.77	NA	9/20/12 19:13		310427	
Tetrachloroethene (PCE)	5.5 U	5.5	0.98	.77	NA	9/20/12 19:13		310427	
Toluene	0.96 I	5.5	0.74	.77	NA	9/20/12 19:13		310427	
Trichloroethene (TCE)	4.9 I	5.5	1.2	.77	NA	9/20/12 19:13		310427	
Vinyl Chloride	11	5.5	2.1	.77	NA	9/20/12 19:13		310427	
cis-1,2-Dichloroethene	7.2	5.5	1.1	.77	NA	9/20/12 19:13		310427	
cis-1,3-Dichloropropene	5.5 U	5.5	1.0	.77	NA	9/20/12 19:13		310427	
m,p-Xylenes	11 U	11	1.3	.77	NA	9/20/12 19:13		310427	
n-Butyl Acetate	5.5 U	5.5	0.91	.77	NA	9/20/12 19:13		310427	
o-Xylene	5.5 U	5.5	0.53	.77	NA	9/20/12 19:13		310427	
trans-1,2-Dichloroethene	5.5 U	5.5	0.95	.77	NA	9/20/12 19:13		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-053.0-20120910
Lab Code: R1206036-003

Service Request: R1206036
Date Collected: 9/10/12 1643
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 69.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	5.5 U	5.5	0.23	.77	NA	9/20/12 19:13		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	28-150	9/20/12 19:13	
Dibromofluoromethane	99	63-138	9/20/12 19:13	
Toluene-d8	99	66-138	9/20/12 19:13	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-034.5-20120910
Lab Code: R1206036-004

Service Request: R1206036
Date Collected: 9/10/12 1721
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	84.3	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-034.5-20120910
Lab Code: R1206036-004

Service Request: R1206036
Date Collected: 9/10/12 1721
Date Received: 9/12/12

Units: µg/Kg
Basis: Dry
Percent Solids: 84.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	520	U	520	40	87	NA	9/14/12 21:21		309582	
1,1,2,2-Tetrachloroethane	520	U	520	21	87	NA	9/14/12 21:21		309582	
1,1,2-Trichloroethane	520	U	520	43	87	NA	9/14/12 21:21		309582	
1,1-Dichloroethane (1,1-DCA)	520	U	520	32	87	NA	9/14/12 21:21		309582	
1,1-Dichloroethene (1,1-DCE)	520	U	520	55	87	NA	9/14/12 21:21		309582	
1,2-Dichloroethane	520	U	520	34	87	NA	9/14/12 21:21		309582	
1,2-Dichloropropane	520	U	520	40	87	NA	9/14/12 21:21		309582	
n-Butanol	26000	U	26000	5200	87	NA	9/14/12 21:21		309582	
2-Butanone (MEK)	520	U	520	160	87	NA	9/14/12 21:21		309582	
2-Hexanone	520	U	520	60	87	NA	9/14/12 21:21		309582	
4-Methyl-2-pentanone	520	U	520	52	87	NA	9/14/12 21:21		309582	
Acetone	520	U	520	120	87	NA	9/14/12 21:21		309582	
Benzene	520	U	520	28	87	NA	9/14/12 21:21		309582	
Bromodichloromethane	520	U	520	26	87	NA	9/14/12 21:21		309582	
Bromoform	520	U	520	68	87	NA	9/14/12 21:21		309582	
Bromomethane	72	I	520	47	87	NA	9/14/12 21:21		309582	
Carbon Disulfide	520	U	520	31	87	NA	9/14/12 21:21		309582	
Carbon Tetrachloride	520	U	520	27	87	NA	9/14/12 21:21		309582	
Chlorobenzene	520	U	520	29	87	NA	9/14/12 21:21		309582	
Chloroethane	520	U	520	40	87	NA	9/14/12 21:21		309582	
Chloroform	520	U	520	45	87	NA	9/14/12 21:21		309582	
Chloromethane	520	U	520	48	87	NA	9/14/12 21:21		309582	
Dibromochloromethane	520	U	520	24	87	NA	9/14/12 21:21		309582	
Dichloromethane	520	U	520	48	87	NA	9/14/12 21:21		309582	
Ethylbenzene	520	U	520	32	87	NA	9/14/12 21:21		309582	
Styrene	520	U	520	21	87	NA	9/14/12 21:21		309582	
Tetrachloroethene (PCE)	520	U	520	21	87	NA	9/14/12 21:21		309582	
Toluene	520	U	520	36	87	NA	9/14/12 21:21		309582	
Trichloroethene (TCE)	520	U	520	21	87	NA	9/14/12 21:21		309582	
Vinyl Chloride	50	I	520	34	87	NA	9/14/12 21:21		309582	
cis-1,2-Dichloroethene	850		520	26	87	NA	9/14/12 21:21		309582	
cis-1,3-Dichloropropene	520	U	520	27	87	NA	9/14/12 21:21		309582	
m,p-Xylenes	1000	U	1000	56	87	NA	9/14/12 21:21		309582	
n-Butyl Acetate	520	U	520	24	87	NA	9/14/12 21:21		309582	
o-Xylene	520	U	520	30	87	NA	9/14/12 21:21		309582	
trans-1,2-Dichloroethene	520	U	520	40	87	NA	9/14/12 21:21		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-034.5-20120910
Lab Code: R1206036-004

Service Request: R1206036
Date Collected: 9/10/12 1721
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 84.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	520	U	520	25	87	NA	9/14/12 21:21		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 21:21	
Dibromofluoromethane	101	89-119	9/14/12 21:21	
Toluene-d8	97	87-121	9/14/12 21:21	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-037.0-20120910
Lab Code: R1206036-005

Service Request: R1206036
Date Collected: 9/10/12 1734
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	83.6	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
 Project: ESTCP LC34 FO 0552B
 Sample Matrix: Soil
 Sample Name: LC34-DPT0351-037.0-20120910
 Lab Code: R1206036-005

Service Request: R1206036
 Date Collected: 9/10/12 1734
 Date Received: 9/12/12

Units: µg/Kg
 Basis: Dry
 Percent Solids: 83.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	4.1	U	4.1	0.60	.68	NA	9/20/12 19:51		310427	
1,1,2,2-Tetrachloroethane	4.1	U	4.1	0.66	.68	NA	9/20/12 19:51		310427	
1,1,2-Trichloroethane	4.1	U	4.1	0.60	.68	NA	9/20/12 19:51		310427	
1,1-Dichloroethane (1,1-DCA)	4.1	U	4.1	1.1	.68	NA	9/20/12 19:51		310427	
1,1-Dichloroethene (1,1-DCE)	4.1	U	4.1	1.1	.68	NA	9/20/12 19:51		310427	
1,2-Dichloroethane	4.1	U	4.1	0.50	.68	NA	9/20/12 19:51		310427	
1,2-Dichloropropane	4.1	U	4.1	0.79	.68	NA	9/20/12 19:51		310427	
n-Butanol	200	U	200	43	.68	NA	9/20/12 19:51		310427	
2-Butanone (MEK)	4.4		4.1	1.9	.68	NA	9/20/12 19:51		310427	
2-Hexanone	4.1	U	4.1	0.99	.68	NA	9/20/12 19:51		310427	
4-Methyl-2-pentanone	4.1	U	4.1	0.80	.68	NA	9/20/12 19:51		310427	
Acetone	20		4.1	2.3	.68	NA	9/20/12 19:51		310427	
Benzene	4.1	U	4.1	0.24	.68	NA	9/20/12 19:51		310427	
Bromodichloromethane	4.1	U	4.1	0.50	.68	NA	9/20/12 19:51		310427	
Bromoform	4.1	U	4.1	0.76	.68	NA	9/20/12 19:51		310427	
Bromomethane	4.1	U	4.1	1.2	.68	NA	9/20/12 19:51		310427	
Carbon Disulfide	26		4.1	1.1	.68	NA	9/20/12 19:51		310427	
Carbon Tetrachloride	4.1	U	4.1	0.75	.68	NA	9/20/12 19:51		310427	
Chlorobenzene	4.1	U	4.1	0.24	.68	NA	9/20/12 19:51		310427	
Chloroethane	4.1	U	4.1	2.4	.68	NA	9/20/12 19:51		310427	
Chloroform	4.1	U	4.1	1.1	.68	NA	9/20/12 19:51		310427	
Chloromethane	4.1	U	4.1	0.33	.68	NA	9/20/12 19:51		310427	
Dibromochloromethane	4.1	U	4.1	0.60	.68	NA	9/20/12 19:51		310427	
Dichloromethane	4.1	U	4.1	0.47	.68	NA	9/20/12 19:51		310427	
Ethylbenzene	4.1	U	4.1	0.19	.68	NA	9/20/12 19:51		310427	
Styrene	4.1	U	4.1	0.25	.68	NA	9/20/12 19:51		310427	
Tetrachloroethene (PCE)	4.1	U	4.1	0.72	.68	NA	9/20/12 19:51		310427	
Toluene	0.60	I	4.1	0.55	.68	NA	9/20/12 19:51		310427	
Trichloroethene (TCE)	5.7		4.1	0.83	.68	NA	9/20/12 19:51		310427	
Vinyl Chloride	650		540	35	91	NA	9/21/12 13:31		310599	
cis-1,2-Dichloroethene	30		4.1	0.78	.68	NA	9/20/12 19:51		310427	
cis-1,3-Dichloropropene	4.1	U	4.1	0.74	.68	NA	9/20/12 19:51		310427	
m,p-Xylenes	8.1	U	8.1	0.89	.68	NA	9/20/12 19:51		310427	
n-Butyl Acetate	4.1	U	4.1	0.67	.68	NA	9/20/12 19:51		310427	
o-Xylene	4.1	U	4.1	0.40	.68	NA	9/20/12 19:51		310427	
trans-1,2-Dichloroethene	30		4.1	0.70	.68	NA	9/20/12 19:51		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-037.0-20120910
Lab Code: R1206036-005

Service Request: R1206036
Date Collected: 9/10/12 1734
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 83.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	4.1	U	4.1	0.17	.68	NA	9/20/12 19:51		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/20/12 19:51	
Dibromofluoromethane	100	89-119	9/20/12 19:51	
Toluene-d8	97	87-121	9/20/12 19:51	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-040.0-20120910
Lab Code: R1206036-006

Service Request: R1206036
Date Collected: 9/10/12 1739
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	82.3	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-040.0-20120910
Lab Code: R1206036-006

Service Request: R1206036
Date Collected: 9/10/12 1739
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 82.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.2	U	5.2	0.76	.85	NA	9/20/12 18:35		310427	
1,1,2,2-Tetrachloroethane	5.2	U	5.2	0.84	.85	NA	9/20/12 18:35		310427	
1,1,2-Trichloroethane	5.2	U	5.2	0.76	.85	NA	9/20/12 18:35		310427	
1,1-Dichloroethane (1,1-DCA)	5.2	U	5.2	1.3	.85	NA	9/20/12 18:35		310427	
1,1-Dichloroethene (1,1-DCE)	5.2	U	5.2	1.4	.85	NA	9/20/12 18:35		310427	
1,2-Dichloroethane	5.2	U	5.2	0.64	.85	NA	9/20/12 18:35		310427	
1,2-Dichloropropane	5.2	U	5.2	1.1	.85	NA	9/20/12 18:35		310427	
n-Butanol	260	U	260	54	.85	NA	9/20/12 18:35		310427	
2-Butanone (MEK)	6.9		5.2	2.4	.85	NA	9/20/12 18:35		310427	
2-Hexanone	5.2	U	5.2	1.3	.85	NA	9/20/12 18:35		310427	
4-Methyl-2-pentanone	5.2	U	5.2	1.1	.85	NA	9/20/12 18:35		310427	
Acetone	31		5.2	3.0	.85	NA	9/20/12 18:35		310427	
Benzene	5.2	U	5.2	0.30	.85	NA	9/20/12 18:35		310427	
Bromodichloromethane	5.2	U	5.2	0.64	.85	NA	9/20/12 18:35		310427	
Bromoform	5.2	U	5.2	0.97	.85	NA	9/20/12 18:35		310427	
Bromomethane	5.2	U	5.2	1.5	.85	NA	9/20/12 18:35		310427	
Carbon Disulfide	44		5.2	1.3	.85	NA	9/20/12 18:35		310427	
Carbon Tetrachloride	5.2	U	5.2	0.96	.85	NA	9/20/12 18:35		310427	
Chlorobenzene	5.2	U	5.2	0.30	.85	NA	9/20/12 18:35		310427	
Chloroethane	5.2	U	5.2	3.0	.85	NA	9/20/12 18:35		310427	
Chloroform	5.2	U	5.2	1.4	.85	NA	9/20/12 18:35		310427	
Chloromethane	5.2	U	5.2	0.42	.85	NA	9/20/12 18:35		310427	
Dibromochloromethane	5.2	U	5.2	0.76	.85	NA	9/20/12 18:35		310427	
Dichloromethane	5.2	U	5.2	0.59	.85	NA	9/20/12 18:35		310427	
Ethylbenzene	5.2	U	5.2	0.24	.85	NA	9/20/12 18:35		310427	
Styrene	5.2	U	5.2	0.31	.85	NA	9/20/12 18:35		310427	
Tetrachloroethene (PCE)	5.2	U	5.2	0.91	.85	NA	9/20/12 18:35		310427	
Toluene	1.5	I	5.2	0.70	.85	NA	9/20/12 18:35		310427	
Trichloroethene (TCE)	5.4		5.2	1.1	.85	NA	9/20/12 18:35		310427	
Vinyl Chloride	33		5.2	2.0	.85	NA	9/20/12 18:35		310427	
cis-1,2-Dichloroethene	100		5.2	0.99	.85	NA	9/20/12 18:35		310427	
cis-1,3-Dichloropropene	5.2	U	5.2	0.93	.85	NA	9/20/12 18:35		310427	
m,p-Xylenes	10	U	10	1.2	.85	NA	9/20/12 18:35		310427	
n-Butyl Acetate	5.2	U	5.2	0.85	.85	NA	9/20/12 18:35		310427	
o-Xylene	5.2	U	5.2	0.50	.85	NA	9/20/12 18:35		310427	
trans-1,2-Dichloroethene	43		5.2	0.89	.85	NA	9/20/12 18:35		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-040.0-20120910
Lab Code: R1206036-006

Service Request: R1206036
Date Collected: 9/10/12 1739
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 82.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	5.2 U	5.2	0.21	.85	NA	9/20/12 18:35		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	28-150	9/20/12 18:35	
Dibromofluoromethane	99	63-138	9/20/12 18:35	
Toluene-d8	99	66-138	9/20/12 18:35	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-047.0-20120910
Lab Code: R1206036-007

Service Request: R1206036
Date Collected: 9/10/12 1809
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	70.8	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-047.0-20120910
Lab Code: R1206036-007

Service Request: R1206036
Date Collected: 9/10/12 1809
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 70.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	610	U	610	47	86.5	NA	9/14/12 21:54		309582	
1,1,2,2-Tetrachloroethane	610	U	610	25	86.5	NA	9/14/12 21:54		309582	
1,1,2-Trichloroethane	610	U	610	51	86.5	NA	9/14/12 21:54		309582	
1,1-Dichloroethane (1,1-DCA)	610	U	610	38	86.5	NA	9/14/12 21:54		309582	
1,1-Dichloroethene (1,1-DCE)	610	U	610	65	86.5	NA	9/14/12 21:54		309582	
1,2-Dichloroethane	610	U	610	40	86.5	NA	9/14/12 21:54		309582	
1,2-Dichloropropane	610	U	610	47	86.5	NA	9/14/12 21:54		309582	
n-Butanol	31000	U	31000	6200	86.5	NA	9/14/12 21:54		309582	
2-Butanone (MEK)	610	U	610	190	86.5	NA	9/14/12 21:54		309582	
2-Hexanone	610	U	610	71	86.5	NA	9/14/12 21:54		309582	
4-Methyl-2-pentanone	610	U	610	62	86.5	NA	9/14/12 21:54		309582	
Acetone	610	U	610	140	86.5	NA	9/14/12 21:54		309582	
Benzene	610	U	610	33	86.5	NA	9/14/12 21:54		309582	
Bromodichloromethane	610	U	610	31	86.5	NA	9/14/12 21:54		309582	
Bromoform	610	U	610	80	86.5	NA	9/14/12 21:54		309582	
Bromomethane	89	I	610	55	86.5	NA	9/14/12 21:54		309582	
Carbon Disulfide	53	I	610	37	86.5	NA	9/14/12 21:54		309582	
Carbon Tetrachloride	610	U	610	32	86.5	NA	9/14/12 21:54		309582	
Chlorobenzene	610	U	610	35	86.5	NA	9/14/12 21:54		309582	
Chloroethane	610	U	610	47	86.5	NA	9/14/12 21:54		309582	
Chloroform	610	U	610	53	86.5	NA	9/14/12 21:54		309582	
Chloromethane	610	U	610	57	86.5	NA	9/14/12 21:54		309582	
Dibromochloromethane	610	U	610	29	86.5	NA	9/14/12 21:54		309582	
Dichloromethane	610	U	610	57	86.5	NA	9/14/12 21:54		309582	
Ethylbenzene	610	U	610	38	86.5	NA	9/14/12 21:54		309582	
Styrene	610	U	610	25	86.5	NA	9/14/12 21:54		309582	
Tetrachloroethene (PCE)	610	U	610	25	86.5	NA	9/14/12 21:54		309582	
Toluene	610	U	610	42	86.5	NA	9/14/12 21:54		309582	
Trichloroethene (TCE)	10000		610	25	86.5	NA	9/14/12 21:54		309582	
Vinyl Chloride	170	I	610	40	86.5	NA	9/14/12 21:54		309582	
cis-1,2-Dichloroethene	14000		610	31	86.5	NA	9/14/12 21:54		309582	
cis-1,3-Dichloropropene	610	U	610	32	86.5	NA	9/14/12 21:54		309582	
m,p-Xylenes	1200	U	1200	66	86.5	NA	9/14/12 21:54		309582	
n-Butyl Acetate	610	U	610	29	86.5	NA	9/14/12 21:54		309582	
o-Xylene	610	U	610	36	86.5	NA	9/14/12 21:54		309582	
trans-1,2-Dichloroethene	61	I	610	47	86.5	NA	9/14/12 21:54		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-047.0-20120910
Lab Code: R1206036-007

Service Request: R1206036
Date Collected: 9/10/12 1809
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 70.8

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	610	U	610	30	86.5	NA	9/14/12 21:54		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	9/14/12 21:54	
Dibromofluoromethane	103	89-119	9/14/12 21:54	
Toluene-d8	99	87-121	9/14/12 21:54	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-045.5-20120911
Lab Code: R1206036-008

Service Request: R1206036
Date Collected: 9/11/12 0913
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.3	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-045.5-20120911
Lab Code: R1206036-008

Service Request: R1206036
Date Collected: 9/11/12 0913
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	640	U	640	49	92	NA	9/19/12 08:22		309793	
1,1,2,2-Tetrachloroethane	640	U	640	26	92	NA	9/19/12 08:22		309793	
1,1,2-Trichloroethane	640	U	640	53	92	NA	9/19/12 08:22		309793	
1,1-Dichloroethane (1,1-DCA)	640	U	640	40	92	NA	9/19/12 08:22		309793	
1,1-Dichloroethene (1,1-DCE)	640	U	640	68	92	NA	9/19/12 08:22		309793	
1,2-Dichloroethane	640	U	640	41	92	NA	9/19/12 08:22		309793	
1,2-Dichloropropane	640	U	640	49	92	NA	9/19/12 08:22		309793	
n-Butanol	32000	U	32000	6400	92	NA	9/19/12 08:22		309793	
2-Butanone (MEK)	640	U	640	200	92	NA	9/19/12 08:22		309793	
2-Hexanone	640	U	640	74	92	NA	9/19/12 08:22		309793	
4-Methyl-2-pentanone	640	U	640	64	92	NA	9/19/12 08:22		309793	
Acetone	640	U	640	140	92	NA	9/19/12 08:22		309793	
Benzene	640	U	640	35	92	NA	9/19/12 08:22		309793	
Bromodichloromethane	640	U	640	32	92	NA	9/19/12 08:22		309793	
Bromoform	640	U	640	83	92	NA	9/19/12 08:22		309793	
Bromomethane	89	IV	640	58	92	NA	9/19/12 08:22		309793	
Carbon Disulfide	55	I	640	39	92	NA	9/19/12 08:22		309793	
Carbon Tetrachloride	640	U	640	34	92	NA	9/19/12 08:22		309793	
Chlorobenzene	640	U	640	36	92	NA	9/19/12 08:22		309793	
Chloroethane	640	U	640	49	92	NA	9/19/12 08:22		309793	
Chloroform	640	U	640	55	92	NA	9/19/12 08:22		309793	
Chloromethane	640	U	640	59	92	NA	9/19/12 08:22		309793	
Dibromochloromethane	640	U	640	30	92	NA	9/19/12 08:22		309793	
Dichloromethane	640	U	640	59	92	NA	9/19/12 08:22		309793	
Ethylbenzene	640	U	640	40	92	NA	9/19/12 08:22		309793	
Styrene	640	U	640	26	92	NA	9/19/12 08:22		309793	
Tetrachloroethene (PCE)	640	U	640	26	92	NA	9/19/12 08:22		309793	
Toluene	640	U	640	44	92	NA	9/19/12 08:22		309793	
Trichloroethene (TCE)	6400		640	26	92	NA	9/19/12 08:22		309793	
Vinyl Chloride	1200		640	41	92	NA	9/19/12 08:22		309793	
cis-1,2-Dichloroethene	8900		640	32	92	NA	9/19/12 08:22		309793	
cis-1,3-Dichloropropene	640	U	640	34	92	NA	9/19/12 08:22		309793	
m,p-Xylenes	1300	U	1300	69	92	NA	9/19/12 08:22		309793	
n-Butyl Acetate	640	U	640	30	92	NA	9/19/12 08:22		309793	
o-Xylene	640	U	640	37	92	NA	9/19/12 08:22		309793	
trans-1,2-Dichloroethene	61	I	640	49	92	NA	9/19/12 08:22		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-045.5-20120911
Lab Code: R1206036-008

Service Request: R1206036
Date Collected: 9/11/12 0913
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.3

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
trans-1,3-Dichloropropene	640	U	640	31	92	NA	9/19/12 08:22		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/19/12 08:22	
Dibromofluoromethane	102	89-119	9/19/12 08:22	
Toluene-d8	99	87-121	9/19/12 08:22	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-047.0-20120911
Lab Code: R1206036-009

Service Request: R1206036
Date Collected: 9/11/12 0919
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.0	Percent	1.0	I	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-047.0-20120911
Lab Code: R1206036-009

Service Request: R1206036
Date Collected: 9/11/12 0919
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution	Date	Date	Extraction Analysis		Note
					Factor	Extracted	Analyzed	Lot	Lot	
1,1,1-Trichloroethane (TCA)	1000	U	1000	80	153	NA	9/15/12 01:11		309582	
1,1,2,2-Tetrachloroethane	1000	U	1000	42	153	NA	9/15/12 01:11		309582	
1,1,2-Trichloroethane	1000	U	1000	86	153	NA	9/15/12 01:11		309582	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	65	153	NA	9/15/12 01:11		309582	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	120	153	NA	9/15/12 01:11		309582	
1,2-Dichloroethane	1000	U	1000	68	153	NA	9/15/12 01:11		309582	
1,2-Dichloropropane	1000	U	1000	80	153	NA	9/15/12 01:11		309582	
n-Butanol	52000	U	52000	11000	153	NA	9/15/12 01:11		309582	
2-Butanone (MEK)	1000	U	1000	330	153	NA	9/15/12 01:11		309582	
2-Hexanone	1000	U	1000	130	153	NA	9/15/12 01:11		309582	
4-Methyl-2-pentanone	1000	U	1000	110	153	NA	9/15/12 01:11		309582	
Acetone	1000	U	1000	230	153	NA	9/15/12 01:11		309582	
Benzene	1000	U	1000	57	153	NA	9/15/12 01:11		309582	
Bromodichloromethane	1000	U	1000	53	153	NA	9/15/12 01:11		309582	
Bromoform	1000	U	1000	140	153	NA	9/15/12 01:11		309582	
Bromomethane	110	I	1000	95	153	NA	9/15/12 01:11		309582	
Carbon Disulfide	1000	U	1000	63	153	NA	9/15/12 01:11		309582	
Carbon Tetrachloride	1000	U	1000	55	153	NA	9/15/12 01:11		309582	
Chlorobenzene	1000	U	1000	59	153	NA	9/15/12 01:11		309582	
Chloroethane	1000	U	1000	80	153	NA	9/15/12 01:11		309582	
Chloroform	1000	U	1000	91	153	NA	9/15/12 01:11		309582	
Chloromethane	1000	U	1000	97	153	NA	9/15/12 01:11		309582	
Dibromochloromethane	1000	U	1000	49	153	NA	9/15/12 01:11		309582	
Dichloromethane	1000	U	1000	97	153	NA	9/15/12 01:11		309582	
Ethylbenzene	1000	U	1000	65	153	NA	9/15/12 01:11		309582	
Styrene	1000	U	1000	42	153	NA	9/15/12 01:11		309582	
Tetrachloroethene (PCE)	1000	U	1000	42	153	NA	9/15/12 01:11		309582	
Toluene	1000	U	1000	72	153	NA	9/15/12 01:11		309582	
Trichloroethene (TCE)	120	I	1000	42	153	NA	9/15/12 01:11		309582	
Vinyl Chloride	610	I	1000	68	153	NA	9/15/12 01:11		309582	
cis-1,2-Dichloroethene	21000		1000	53	153	NA	9/15/12 01:11		309582	
cis-1,3-Dichloropropene	1000	U	1000	55	153	NA	9/15/12 01:11		309582	
m,p-Xylenes	2100	U	2100	120	153	NA	9/15/12 01:11		309582	
n-Butyl Acetate	1000	U	1000	49	153	NA	9/15/12 01:11		309582	
o-Xylene	1000	U	1000	61	153	NA	9/15/12 01:11		309582	
trans-1,2-Dichloroethene	94	I	1000	80	153	NA	9/15/12 01:11		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-047.0-20120911
Lab Code: R1206036-009

Service Request: R1206036
Date Collected: 9/11/12 0919
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.0

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1000	U	1000	51	153	NA	9/15/12 01:11		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	9/15/12 01:11	
Dibromofluoromethane	100	89-119	9/15/12 01:11	
Toluene-d8	97	87-121	9/15/12 01:11	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-048.5-20120911
Lab Code: R1206036-010

Service Request: R1206036
Date Collected: 9/11/12 0929
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6		Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-048.5-20120911
Lab Code: R1206036-010

Service Request: R1206036
Date Collected: 9/11/12 0929
Date Received: 9/12/12

Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	850	U	850	65	124	NA	9/15/12 01:44		309582	
1,1,2,2-Tetrachloroethane	850	U	850	35	124	NA	9/15/12 01:44		309582	
1,1,2-Trichloroethane	850	U	850	71	124	NA	9/15/12 01:44		309582	
1,1-Dichloroethane (1,1-DCA)	850	U	850	53	124	NA	9/15/12 01:44		309582	
1,1-Dichloroethene (1,1-DCE)	850	U	850	91	124	NA	9/15/12 01:44		309582	
1,2-Dichloroethane	850	U	850	55	124	NA	9/15/12 01:44		309582	
1,2-Dichloropropane	850	U	850	65	124	NA	9/15/12 01:44		309582	
n-Butanol	43000	U	43000	8600	124	NA	9/15/12 01:44		309582	
2-Butanone (MEK)	850	U	850	270	124	NA	9/15/12 01:44		309582	
2-Hexanone	850	U	850	100	124	NA	9/15/12 01:44		309582	
4-Methyl-2-pentanone	850	U	850	86	124	NA	9/15/12 01:44		309582	
Acetone	850	U	850	190	124	NA	9/15/12 01:44		309582	
Benzene	850	U	850	47	124	NA	9/15/12 01:44		309582	
Bromodichloromethane	850	U	850	43	124	NA	9/15/12 01:44		309582	
Bromoform	850	U	850	120	124	NA	9/15/12 01:44		309582	
Bromomethane	850	U	850	77	124	NA	9/15/12 01:44		309582	
Carbon Disulfide	850	U	850	52	124	NA	9/15/12 01:44		309582	
Carbon Tetrachloride	850	U	850	45	124	NA	9/15/12 01:44		309582	
Chlorobenzene	850	U	850	48	124	NA	9/15/12 01:44		309582	
Chloroethane	850	U	850	65	124	NA	9/15/12 01:44		309582	
Chloroform	850	U	850	74	124	NA	9/15/12 01:44		309582	
Chloromethane	850	U	850	79	124	NA	9/15/12 01:44		309582	
Dibromochloromethane	850	U	850	40	124	NA	9/15/12 01:44		309582	
Dichloromethane	850	U	850	79	124	NA	9/15/12 01:44		309582	
Ethylbenzene	850	U	850	53	124	NA	9/15/12 01:44		309582	
Styrene	850	U	850	35	124	NA	9/15/12 01:44		309582	
Tetrachloroethene (PCE)	850	U	850	35	124	NA	9/15/12 01:44		309582	
Toluene	850	U	850	59	124	NA	9/15/12 01:44		309582	
Trichloroethene (TCE)	130	I	850	35	124	NA	9/15/12 01:44		309582	
Vinyl Chloride	1300		850	55	124	NA	9/15/12 01:44		309582	
cis-1,2-Dichloroethene	17000		850	43	124	NA	9/15/12 01:44		309582	
cis-1,3-Dichloropropene	850	U	850	45	124	NA	9/15/12 01:44		309582	
m,p-Xylenes	1700	U	1700	93	124	NA	9/15/12 01:44		309582	
n-Butyl Acetate	850	U	850	40	124	NA	9/15/12 01:44		309582	
o-Xylene	850	U	850	50	124	NA	9/15/12 01:44		309582	
trans-1,2-Dichloroethene	79	I	850	65	124	NA	9/15/12 01:44		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-048.5-20120911
Lab Code: R1206036-010

Service Request: R1206036
Date Collected: 9/11/12 0929
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	850 U	850	41	124	NA	9/15/12 01:44		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/15/12 01:44	
Dibromofluoromethane	101	89-119	9/15/12 01:44	
Toluene-d8	99	87-121	9/15/12 01:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-053.0-20120910
Lab Code: R1206036-011

Service Request: R1206036
Date Collected: 9/11/12 0938
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	85.6	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-053.0-20120910
Lab Code: R1206036-011

Service Request: R1206036
Date Collected: 9/11/12 0938
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 85.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	4.4	U	4.4	0.65	.76	NA	9/20/12 21:05		310427	
1,1,2,2-Tetrachloroethane	4.4	U	4.4	0.72	.76	NA	9/20/12 21:05		310427	
1,1,2-Trichloroethane	4.4	U	4.4	0.65	.76	NA	9/20/12 21:05		310427	
1,1-Dichloroethane (1,1-DCA)	4.4	U	4.4	1.2	.76	NA	9/20/12 21:05		310427	
1,1-Dichloroethene (1,1-DCE)	4.4	U	4.4	1.2	.76	NA	9/20/12 21:05		310427	
1,2-Dichloroethane	4.4	U	4.4	0.55	.76	NA	9/20/12 21:05		310427	
1,2-Dichloropropane	4.4	U	4.4	0.87	.76	NA	9/20/12 21:05		310427	
n-Butanol	220	U	220	47	.76	NA	9/20/12 21:05		310427	
2-Butanone (MEK)	4.4	U	4.4	2.1	.76	NA	9/20/12 21:05		310427	
2-Hexanone	4.4	U	4.4	1.1	.76	NA	9/20/12 21:05		310427	
4-Methyl-2-pentanone	4.4	U	4.4	0.88	.76	NA	9/20/12 21:05		310427	
Acetone	4.4	U	4.4	2.5	.76	NA	9/20/12 21:05		310427	
Benzene	4.4	U	4.4	0.26	.76	NA	9/20/12 21:05		310427	
Bromodichloromethane	4.4	U	4.4	0.55	.76	NA	9/20/12 21:05		310427	
Bromoform	4.4	U	4.4	0.83	.76	NA	9/20/12 21:05		310427	
Bromomethane	4.4	U	4.4	1.3	.76	NA	9/20/12 21:05		310427	
Carbon Disulfide	8.4		4.4	1.2	.76	NA	9/20/12 21:05		310427	
Carbon Tetrachloride	4.4	U	4.4	0.82	.76	NA	9/20/12 21:05		310427	
Chlorobenzene	4.4	U	4.4	0.26	.76	NA	9/20/12 21:05		310427	
Chloroethane	4.4	U	4.4	2.6	.76	NA	9/20/12 21:05		310427	
Chloroform	4.4	U	4.4	1.2	.76	NA	9/20/12 21:05		310427	
Chloromethane	4.4	U	4.4	0.36	.76	NA	9/20/12 21:05		310427	
Dibromochloromethane	4.4	U	4.4	0.65	.76	NA	9/20/12 21:05		310427	
Dichloromethane	4.4	U	4.4	0.51	.76	NA	9/20/12 21:05		310427	
Ethylbenzene	4.4	U	4.4	0.21	.76	NA	9/20/12 21:05		310427	
Styrene	4.4	U	4.4	0.27	.76	NA	9/20/12 21:05		310427	
Tetrachloroethene (PCE)	4.4	U	4.4	0.79	.76	NA	9/20/12 21:05		310427	
Toluene	0.75	I	4.4	0.60	.76	NA	9/20/12 21:05		310427	
Trichloroethene (TCE)	4.4	U	4.4	0.90	.76	NA	9/20/12 21:05		310427	
Vinyl Chloride	2.7	I	4.4	1.7	.76	NA	9/20/12 21:05		310427	
cis-1,2-Dichloroethene	1.5	I	4.4	0.85	.76	NA	9/20/12 21:05		310427	
cis-1,3-Dichloropropene	4.4	U	4.4	0.80	.76	NA	9/20/12 21:05		310427	
m,p-Xylenes	8.9	U	8.9	0.97	.76	NA	9/20/12 21:05		310427	
n-Butyl Acetate	0.78	I	4.4	0.73	.76	NA	9/20/12 21:05		310427	
o-Xylene	4.4	U	4.4	0.43	.76	NA	9/20/12 21:05		310427	
trans-1,2-Dichloroethene	4.4	U	4.4	0.77	.76	NA	9/20/12 21:05		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0351-053.0-20120910
Lab Code: R1206036-011

Service Request: R1206036
Date Collected: 9/11/12 0938
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 85.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	4.4	U	4.4	0.18	.76	NA	9/20/12 21:05		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	28-150	9/20/12 21:05	
Dibromofluoromethane	101	63-138	9/20/12 21:05	
Toluene-d8	100	66-138	9/20/12 21:05	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-037.0-20120910
Lab Code: R1206036-012

Service Request: R1206036
Date Collected: 9/10/12 1044
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	82.4	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-037.0-20120910
Lab Code: R1206036-012

Service Request: R1206036
Date Collected: 9/10/12 1044
Date Received: 9/12/12

Units: µg/Kg
Basis: Dry
Percent Solids: 82.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	1000	U	1000	77	166.5	NA	9/20/12 17:07		310398	
1,1,2,2-Tetrachloroethane	1000	U	1000	41	166.5	NA	9/20/12 17:07		310398	
1,1,2-Trichloroethane	1000	U	1000	83	166.5	NA	9/20/12 17:07		310398	
1,1-Dichloroethane (1,1-DCA)	1000	U	1000	63	166.5	NA	9/20/12 17:07		310398	
1,1-Dichloroethene (1,1-DCE)	1000	U	1000	110	166.5	NA	9/20/12 17:07		310398	
1,2-Dichloroethane	1000	U	1000	65	166.5	NA	9/20/12 17:07		310398	
1,2-Dichloropropane	1000	U	1000	77	166.5	NA	9/20/12 17:07		310398	
n-Butanol	51000	U	51000	11000	166.5	NA	9/20/12 17:07		310398	
2-Butanone (MEK)	1000	U	1000	320	166.5	NA	9/20/12 17:07		310398	
2-Hexanone	1000	U	1000	120	166.5	NA	9/20/12 17:07		310398	
4-Methyl-2-pentanone	1000	U	1000	110	166.5	NA	9/20/12 17:07		310398	
Acetone	1000	U	1000	230	166.5	NA	9/20/12 17:07		310398	
Benzene	1000	U	1000	55	166.5	NA	9/20/12 17:07		310398	
Bromodichloromethane	1000	U	1000	51	166.5	NA	9/20/12 17:07		310398	
Bromoform	1000	U	1000	140	166.5	NA	9/20/12 17:07		310398	
Bromomethane	1000	U	1000	91	166.5	NA	9/20/12 17:07		310398	
Carbon Disulfide	120	I	1000	61	166.5	NA	9/20/12 17:07		310398	
Carbon Tetrachloride	1000	U	1000	53	166.5	NA	9/20/12 17:07		310398	
Chlorobenzene	1000	U	1000	57	166.5	NA	9/20/12 17:07		310398	
Chloroethane	1000	U	1000	77	166.5	NA	9/20/12 17:07		310398	
Chloroform	1000	U	1000	87	166.5	NA	9/20/12 17:07		310398	
Chloromethane	1000	U	1000	93	166.5	NA	9/20/12 17:07		310398	
Dibromochloromethane	1000	U	1000	47	166.5	NA	9/20/12 17:07		310398	
Dichloromethane	1000	U	1000	93	166.5	NA	9/20/12 17:07		310398	
Ethylbenzene	1000	U	1000	63	166.5	NA	9/20/12 17:07		310398	
Styrene	1000	U	1000	41	166.5	NA	9/20/12 17:07		310398	
Tetrachloroethene (PCE)	1000	U	1000	41	166.5	NA	9/20/12 17:07		310398	
Toluene	1000	U	1000	69	166.5	NA	9/20/12 17:07		310398	
Trichloroethene (TCE)	2900		1000	41	166.5	NA	9/20/12 17:07		310398	
Vinyl Chloride	1700		1000	65	166.5	NA	9/20/12 17:07		310398	
cis-1,2-Dichloroethene	7200		1000	51	166.5	NA	9/20/12 17:07		310398	
cis-1,3-Dichloropropene	1000	U	1000	53	166.5	NA	9/20/12 17:07		310398	
m,p-Xylenes	2000	U	2000	110	166.5	NA	9/20/12 17:07		310398	
n-Butyl Acetate	1000	U	1000	47	166.5	NA	9/20/12 17:07		310398	
o-Xylene	1000	U	1000	59	166.5	NA	9/20/12 17:07		310398	
trans-1,2-Dichloroethene	160	I	1000	77	166.5	NA	9/20/12 17:07		310398	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-037.0-20120910
Lab Code: R1206036-012

Service Request: R1206036
Date Collected: 9/10/12 1044
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 82.4

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1000	U	1000	49	166.5	NA	9/20/12 17:07		310398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	9/20/12 17:07	
Dibromofluoromethane	100	89-119	9/20/12 17:07	
Toluene-d8	99	87-121	9/20/12 17:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-040.0-20120910
Lab Code: R1206036-013

Service Request: R1206036
Date Collected: 9/10/12 1047
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	77.9	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-040.0-20120910
Lab Code: R1206036-013

Service Request: R1206036
Date Collected: 9/10/12 1047
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 77.9

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	740	U	740	57	115.5	NA	9/14/12 22:27		309582	
1,1,2,2-Tetrachloroethane	740	U	740	30	115.5	NA	9/14/12 22:27		309582	
1,1,2-Trichloroethane	740	U	740	61	115.5	NA	9/14/12 22:27		309582	
1,1-Dichloroethane (1,1-DCA)	740	U	740	46	115.5	NA	9/14/12 22:27		309582	
1,1-Dichloroethene (1,1-DCE)	740	U	740	79	115.5	NA	9/14/12 22:27		309582	
1,2-Dichloroethane	740	U	740	48	115.5	NA	9/14/12 22:27		309582	
1,2-Dichloropropane	740	U	740	57	115.5	NA	9/14/12 22:27		309582	
n-Butanol	37000	U	37000	7500	115.5	NA	9/14/12 22:27		309582	
2-Butanone (MEK)	740	U	740	230	115.5	NA	9/14/12 22:27		309582	
2-Hexanone	740	U	740	86	115.5	NA	9/14/12 22:27		309582	
4-Methyl-2-pentanone	740	U	740	75	115.5	NA	9/14/12 22:27		309582	
Acetone	740	U	740	170	115.5	NA	9/14/12 22:27		309582	
Benzene	740	U	740	41	115.5	NA	9/14/12 22:27		309582	
Bromodichloromethane	740	U	740	38	115.5	NA	9/14/12 22:27		309582	
Bromoform	740	U	740	97	115.5	NA	9/14/12 22:27		309582	
Bromomethane	110	I	740	67	115.5	NA	9/14/12 22:27		309582	
Carbon Disulfide	71	I	740	45	115.5	NA	9/14/12 22:27		309582	
Carbon Tetrachloride	740	U	740	39	115.5	NA	9/14/12 22:27		309582	
Chlorobenzene	740	U	740	42	115.5	NA	9/14/12 22:27		309582	
Chloroethane	740	U	740	57	115.5	NA	9/14/12 22:27		309582	
Chloroform	740	U	740	64	115.5	NA	9/14/12 22:27		309582	
Chloromethane	740	U	740	69	115.5	NA	9/14/12 22:27		309582	
Dibromochloromethane	740	U	740	35	115.5	NA	9/14/12 22:27		309582	
Dichloromethane	740	U	740	69	115.5	NA	9/14/12 22:27		309582	
Ethylbenzene	740	U	740	46	115.5	NA	9/14/12 22:27		309582	
Styrene	740	U	740	30	115.5	NA	9/14/12 22:27		309582	
Tetrachloroethene (PCE)	740	U	740	30	115.5	NA	9/14/12 22:27		309582	
Toluene	740	U	740	51	115.5	NA	9/14/12 22:27		309582	
Trichloroethene (TCE)	110	I	740	30	115.5	NA	9/14/12 22:27		309582	
Vinyl Chloride	730	I	740	48	115.5	NA	9/14/12 22:27		309582	
cis-1,2-Dichloroethene	670	I	740	38	115.5	NA	9/14/12 22:27		309582	
cis-1,3-Dichloropropene	740	U	740	39	115.5	NA	9/14/12 22:27		309582	
m,p-Xylenes	1500	U	1500	81	115.5	NA	9/14/12 22:27		309582	
n-Butyl Acetate	740	U	740	35	115.5	NA	9/14/12 22:27		309582	
o-Xylene	740	U	740	43	115.5	NA	9/14/12 22:27		309582	
trans-1,2-Dichloroethene	740	U	740	57	115.5	NA	9/14/12 22:27		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-040.0-20120910
Lab Code: R1206036-013

Service Request: R1206036
Date Collected: 9/10/12 1047
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 77.9

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	740	U	740	36	115.5	NA	9/14/12 22:27		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 22:27	
Dibromofluoromethane	100	89-119	9/14/12 22:27	
Toluene-d8	100	87-121	9/14/12 22:27	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-043.5-20120910
Lab Code: R1206036-014

Service Request: R1206036
Date Collected: 9/10/12 1103
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	78.2	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-043.5-20120910
Lab Code: R1206036-014

Service Request: R1206036
Date Collected: 9/10/12 1103
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 78.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	550	U	550	42	86	NA	9/19/12 08:55		309793	
1,1,2,2-Tetrachloroethane	550	U	550	22	86	NA	9/19/12 08:55		309793	
1,1,2-Trichloroethane	550	U	550	46	86	NA	9/19/12 08:55		309793	
1,1-Dichloroethane (1,1-DCA)	550	U	550	35	86	NA	9/19/12 08:55		309793	
1,1-Dichloroethene (1,1-DCE)	550	U	550	59	86	NA	9/19/12 08:55		309793	
1,2-Dichloroethane	550	U	550	36	86	NA	9/19/12 08:55		309793	
1,2-Dichloropropane	550	U	550	42	86	NA	9/19/12 08:55		309793	
n-Butanol	27000	U	27000	5500	86	NA	9/19/12 08:55		309793	
2-Butanone (MEK)	550	U	550	170	86	NA	9/19/12 08:55		309793	
2-Hexanone	550	U	550	64	86	NA	9/19/12 08:55		309793	
4-Methyl-2-pentanone	550	U	550	55	86	NA	9/19/12 08:55		309793	
Acetone	550	U	550	120	86	NA	9/19/12 08:55		309793	
Benzene	550	U	550	30	86	NA	9/19/12 08:55		309793	
Bromodichloromethane	550	U	550	28	86	NA	9/19/12 08:55		309793	
Bromoform	550	U	550	72	86	NA	9/19/12 08:55		309793	
Bromomethane	62	IV	550	50	86	NA	9/19/12 08:55		309793	
Carbon Disulfide	60	I	550	33	86	NA	9/19/12 08:55		309793	
Carbon Tetrachloride	550	U	550	29	86	NA	9/19/12 08:55		309793	
Chlorobenzene	550	U	550	31	86	NA	9/19/12 08:55		309793	
Chloroethane	550	U	550	42	86	NA	9/19/12 08:55		309793	
Chloroform	550	U	550	48	86	NA	9/19/12 08:55		309793	
Chloromethane	550	U	550	51	86	NA	9/19/12 08:55		309793	
Dibromochloromethane	550	U	550	26	86	NA	9/19/12 08:55		309793	
Dichloromethane	550	U	550	51	86	NA	9/19/12 08:55		309793	
Ethylbenzene	550	U	550	35	86	NA	9/19/12 08:55		309793	
Styrene	550	U	550	22	86	NA	9/19/12 08:55		309793	
Tetrachloroethene (PCE)	550	U	550	22	86	NA	9/19/12 08:55		309793	
Toluene	550	U	550	38	86	NA	9/19/12 08:55		309793	
Trichloroethene (TCE)	1500		550	22	86	NA	9/19/12 08:55		309793	
Vinyl Chloride	1300		550	36	86	NA	9/19/12 08:55		309793	
cis-1,2-Dichloroethene	1200		550	28	86	NA	9/19/12 08:55		309793	
cis-1,3-Dichloropropene	550	U	550	29	86	NA	9/19/12 08:55		309793	
m,p-Xylenes	1100	U	1100	60	86	NA	9/19/12 08:55		309793	
n-Butyl Acetate	550	U	550	26	86	NA	9/19/12 08:55		309793	
o-Xylene	550	U	550	32	86	NA	9/19/12 08:55		309793	
trans-1,2-Dichloroethene	550	U	550	42	86	NA	9/19/12 08:55		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-043.5-20120910
Lab Code: R1206036-014

Service Request: R1206036
Date Collected: 9/10/12 1103
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 78.2

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	550	U	550	27	86	NA	9/19/12 08:55		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/19/12 08:55	
Dibromofluoromethane	103	89-119	9/19/12 08:55	
Toluene-d8	100	87-121	9/19/12 08:55	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-045.0-20120910
Lab Code: R1206036-015

Service Request: R1206036
Date Collected: 9/10/12 1107
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	78.1	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-045.0-20120910
Lab Code: R1206036-015

Service Request: R1206036
Date Collected: 9/10/12 1107
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 78.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	630	U	630	48	98	NA	9/14/12 22:59		309582	
1,1,2,2-Tetrachloroethane	630	U	630	26	98	NA	9/14/12 22:59		309582	
1,1,2-Trichloroethane	630	U	630	52	98	NA	9/14/12 22:59		309582	
1,1-Dichloroethane (1,1-DCA)	630	U	630	39	98	NA	9/14/12 22:59		309582	
1,1-Dichloroethene (1,1-DCE)	630	U	630	67	98	NA	9/14/12 22:59		309582	
1,2-Dichloroethane	630	U	630	41	98	NA	9/14/12 22:59		309582	
1,2-Dichloropropane	630	U	630	48	98	NA	9/14/12 22:59		309582	
n-Butanol	31000	U	31000	6300	98	NA	9/14/12 22:59		309582	
2-Butanone (MEK)	630	U	630	200	98	NA	9/14/12 22:59		309582	
2-Hexanone	630	U	630	73	98	NA	9/14/12 22:59		309582	
4-Methyl-2-pentanone	630	U	630	63	98	NA	9/14/12 22:59		309582	
Acetone	630	U	630	140	98	NA	9/14/12 22:59		309582	
Benzene	630	U	630	34	98	NA	9/14/12 22:59		309582	
Bromodichloromethane	630	U	630	32	98	NA	9/14/12 22:59		309582	
Bromoform	630	U	630	82	98	NA	9/14/12 22:59		309582	
Bromomethane	97	I	630	57	98	NA	9/14/12 22:59		309582	
Carbon Disulfide	48	I	630	38	98	NA	9/14/12 22:59		309582	
Carbon Tetrachloride	630	U	630	33	98	NA	9/14/12 22:59		309582	
Chlorobenzene	630	U	630	36	98	NA	9/14/12 22:59		309582	
Chloroethane	630	U	630	48	98	NA	9/14/12 22:59		309582	
Chloroform	630	U	630	54	98	NA	9/14/12 22:59		309582	
Chloromethane	630	U	630	58	98	NA	9/14/12 22:59		309582	
Dibromochloromethane	630	U	630	29	98	NA	9/14/12 22:59		309582	
Dichloromethane	630	U	630	58	98	NA	9/14/12 22:59		309582	
Ethylbenzene	630	U	630	39	98	NA	9/14/12 22:59		309582	
Styrene	630	U	630	26	98	NA	9/14/12 22:59		309582	
Tetrachloroethene (PCE)	630	U	630	26	98	NA	9/14/12 22:59		309582	
Toluene	630	U	630	43	98	NA	9/14/12 22:59		309582	
Trichloroethene (TCE)	1500		630	26	98	NA	9/14/12 22:59		309582	
Vinyl Chloride	2100		630	41	98	NA	9/14/12 22:59		309582	
cis-1,2-Dichloroethene	3700		630	32	98	NA	9/14/12 22:59		309582	
cis-1,3-Dichloropropene	630	U	630	33	98	NA	9/14/12 22:59		309582	
m,p-Xylenes	1300	U	1300	68	98	NA	9/14/12 22:59		309582	
n-Butyl Acetate	630	U	630	29	98	NA	9/14/12 22:59		309582	
o-Xylene	630	U	630	37	98	NA	9/14/12 22:59		309582	
trans-1,2-Dichloroethene	74	I	630	48	98	NA	9/14/12 22:59		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-045.0-20120910
Lab Code: R1206036-015

Service Request: R1206036
Date Collected: 9/10/12 1107
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 78.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	630	U	630	31	98	NA	9/14/12 22:59		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/14/12 22:59	
Dibromofluoromethane	103	89-119	9/14/12 22:59	
Toluene-d8	99	87-121	9/14/12 22:59	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-046.5-20120910
Lab Code: R1206036-016

Service Request: R1206036
Date Collected: 9/10/12 1133
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.7	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-046.5-20120910
Lab Code: R1206036-016

Service Request: R1206036
Date Collected: 9/10/12 1133
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	1200	U	1200	90	171	NA	9/19/12 11:40		309793	
1,1,2,2-Tetrachloroethane	1200	U	1200	48	171	NA	9/19/12 11:40		309793	
1,1,2-Trichloroethane	1200	U	1200	97	171	NA	9/19/12 11:40		309793	
1,1-Dichloroethane (1,1-DCA)	1200	U	1200	73	171	NA	9/19/12 11:40		309793	
1,1-Dichloroethene (1,1-DCE)	1200	U	1200	130	171	NA	9/19/12 11:40		309793	
1,2-Dichloroethane	1200	U	1200	76	171	NA	9/19/12 11:40		309793	
1,2-Dichloropropane	1200	U	1200	90	171	NA	9/19/12 11:40		309793	
n-Butanol	59000	U	59000	12000	171	NA	9/19/12 11:40		309793	
2-Butanone (MEK)	1200	U	1200	370	171	NA	9/19/12 11:40		309793	
2-Hexanone	1200	U	1200	140	171	NA	9/19/12 11:40		309793	
4-Methyl-2-pentanone	1200	U	1200	120	171	NA	9/19/12 11:40		309793	
Acetone	1200	U	1200	260	171	NA	9/19/12 11:40		309793	
Benzene	1200	U	1200	64	171	NA	9/19/12 11:40		309793	
Bromodichloromethane	1200	U	1200	59	171	NA	9/19/12 11:40		309793	
Bromoform	1200	U	1200	160	171	NA	9/19/12 11:40		309793	
Bromomethane	150	IV	1200	110	171	NA	9/19/12 11:40		309793	
Carbon Disulfide	1200	U	1200	71	171	NA	9/19/12 11:40		309793	
Carbon Tetrachloride	1200	U	1200	62	171	NA	9/19/12 11:40		309793	
Chlorobenzene	1200	U	1200	66	171	NA	9/19/12 11:40		309793	
Chloroethane	1200	U	1200	90	171	NA	9/19/12 11:40		309793	
Chloroform	1200	U	1200	110	171	NA	9/19/12 11:40		309793	
Chloromethane	1200	U	1200	110	171	NA	9/19/12 11:40		309793	
Dibromochloromethane	1200	U	1200	55	171	NA	9/19/12 11:40		309793	
Dichloromethane	1200	U	1200	110	171	NA	9/19/12 11:40		309793	
Ethylbenzene	1200	U	1200	73	171	NA	9/19/12 11:40		309793	
Styrene	1200	U	1200	48	171	NA	9/19/12 11:40		309793	
Tetrachloroethene (PCE)	1200	U	1200	48	171	NA	9/19/12 11:40		309793	
Toluene	1200	U	1200	80	171	NA	9/19/12 11:40		309793	
Trichloroethene (TCE)	30000		1200	48	171	NA	9/19/12 11:40		309793	
Vinyl Chloride	200	I	1200	76	171	NA	9/19/12 11:40		309793	
cis-1,2-Dichloroethene	11000		1200	59	171	NA	9/19/12 11:40		309793	
cis-1,3-Dichloropropene	1200	U	1200	62	171	NA	9/19/12 11:40		309793	
m,p-Xylenes	2400	U	2400	130	171	NA	9/19/12 11:40		309793	
n-Butyl Acetate	1200	U	1200	55	171	NA	9/19/12 11:40		309793	
o-Xylene	1200	U	1200	69	171	NA	9/19/12 11:40		309793	
trans-1,2-Dichloroethene	1200	U	1200	90	171	NA	9/19/12 11:40		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-046.5-20120910
Lab Code: R1206036-016

Service Request: R1206036
Date Collected: 9/10/12 1133
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.7

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	1200	U	1200	57	171	NA	9/19/12 11:40		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/19/12 11:40	
Dibromofluoromethane	100	89-119	9/19/12 11:40	
Toluene-d8	96	87-121	9/19/12 11:40	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-048.0-20120910
Lab Code: R1206036-017

Service Request: R1206036
Date Collected: 9/10/12 1136
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	72.6	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-048.0-20120910
Lab Code: R1206036-017

Service Request: R1206036
Date Collected: 9/10/12 1136
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Analysis		Note
								Lot	Lot	
1,1,1-Trichloroethane (TCA)	610	U	610	47	89	NA	9/19/12 09:28		309793	
1,1,2,2-Tetrachloroethane	610	U	610	25	89	NA	9/19/12 09:28		309793	
1,1,2-Trichloroethane	610	U	610	51	89	NA	9/19/12 09:28		309793	
1,1-Dichloroethane (1,1-DCA)	610	U	610	39	89	NA	9/19/12 09:28		309793	
1,1-Dichloroethene (1,1-DCE)	610	U	610	65	89	NA	9/19/12 09:28		309793	
1,2-Dichloroethane	610	U	610	40	89	NA	9/19/12 09:28		309793	
1,2-Dichloropropane	610	U	610	47	89	NA	9/19/12 09:28		309793	
n-Butanol	31000	U	31000	6200	89	NA	9/19/12 09:28		309793	
2-Butanone (MEK)	610	U	610	190	89	NA	9/19/12 09:28		309793	
2-Hexanone	610	U	610	72	89	NA	9/19/12 09:28		309793	
4-Methyl-2-pentanone	610	U	610	62	89	NA	9/19/12 09:28		309793	
Acetone	610	U	610	140	89	NA	9/19/12 09:28		309793	
Benzene	610	U	610	34	89	NA	9/19/12 09:28		309793	
Bromodichloromethane	610	U	610	31	89	NA	9/19/12 09:28		309793	
Bromoform	610	U	610	80	89	NA	9/19/12 09:28		309793	
Bromomethane	86	IV	610	56	89	NA	9/19/12 09:28		309793	
Carbon Disulfide	47	I	610	37	89	NA	9/19/12 09:28		309793	
Carbon Tetrachloride	610	U	610	32	89	NA	9/19/12 09:28		309793	
Chlorobenzene	610	U	610	35	89	NA	9/19/12 09:28		309793	
Chloroethane	610	U	610	47	89	NA	9/19/12 09:28		309793	
Chloroform	610	U	610	53	89	NA	9/19/12 09:28		309793	
Chloromethane	610	U	610	57	89	NA	9/19/12 09:28		309793	
Dibromochloromethane	610	U	610	29	89	NA	9/19/12 09:28		309793	
Dichloromethane	610	U	610	57	89	NA	9/19/12 09:28		309793	
Ethylbenzene	610	U	610	39	89	NA	9/19/12 09:28		309793	
Styrene	610	U	610	25	89	NA	9/19/12 09:28		309793	
Tetrachloroethene (PCE)	610	U	610	25	89	NA	9/19/12 09:28		309793	
Toluene	610	U	610	42	89	NA	9/19/12 09:28		309793	
Trichloroethene (TCE)	590	I	610	25	89	NA	9/19/12 09:28		309793	
Vinyl Chloride	190	I	610	40	89	NA	9/19/12 09:28		309793	
cis-1,2-Dichloroethene	19000		610	31	89	NA	9/19/12 09:28		309793	
cis-1,3-Dichloropropene	610	U	610	32	89	NA	9/19/12 09:28		309793	
m,p-Xylenes	1200	U	1200	67	89	NA	9/19/12 09:28		309793	
n-Butyl Acetate	610	U	610	29	89	NA	9/19/12 09:28		309793	
o-Xylene	610	U	610	36	89	NA	9/19/12 09:28		309793	
trans-1,2-Dichloroethene	92	I	610	47	89	NA	9/19/12 09:28		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-048.0-20120910
Lab Code: R1206036-017

Service Request: R1206036
Date Collected: 9/10/12 1136
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 72.6

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	610 U	610	30	89	NA	9/19/12 09:28		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	9/19/12 09:28	
Dibromofluoromethane	101	89-119	9/19/12 09:28	
Toluene-d8	98	87-121	9/19/12 09:28	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-053.0-20120910
Lab Code: R1206036-018

Service Request: R1206036
Date Collected: 9/10/12 1148
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	76.9	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-053.0-20120910
Lab Code: R1206036-018

Service Request: R1206036
Date Collected: 9/10/12 1148
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 76.9

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.5	U	5.5	0.81	.85	NA	9/20/12 21:43		310427	
1,1,2,2-Tetrachloroethane	5.5	U	5.5	0.90	.85	NA	9/20/12 21:43		310427	
1,1,2-Trichloroethane	5.5	U	5.5	0.81	.85	NA	9/20/12 21:43		310427	
1,1-Dichloroethane (1,1-DCA)	5.5	U	5.5	1.4	.85	NA	9/20/12 21:43		310427	
1,1-Dichloroethene (1,1-DCE)	5.5	U	5.5	1.5	.85	NA	9/20/12 21:43		310427	
1,2-Dichloroethane	5.5	U	5.5	0.68	.85	NA	9/20/12 21:43		310427	
1,2-Dichloropropane	5.5	U	5.5	1.1	.85	NA	9/20/12 21:43		310427	
n-Butanol	280	U	280	58	.85	NA	9/20/12 21:43		310427	
2-Butanone (MEK)	3.8	I	5.5	2.6	.85	NA	9/20/12 21:43		310427	
2-Hexanone	5.5	U	5.5	1.4	.85	NA	9/20/12 21:43		310427	
4-Methyl-2-pentanone	5.5	U	5.5	1.1	.85	NA	9/20/12 21:43		310427	
Acetone	20		5.5	3.2	.85	NA	9/20/12 21:43		310427	
Benzene	5.5	U	5.5	0.33	.85	NA	9/20/12 21:43		310427	
Bromodichloromethane	5.5	U	5.5	0.68	.85	NA	9/20/12 21:43		310427	
Bromoform	5.5	U	5.5	1.1	.85	NA	9/20/12 21:43		310427	
Bromomethane	5.5	U	5.5	1.6	.85	NA	9/20/12 21:43		310427	
Carbon Disulfide	32		5.5	1.4	.85	NA	9/20/12 21:43		310427	
Carbon Tetrachloride	5.5	U	5.5	1.1	.85	NA	9/20/12 21:43		310427	
Chlorobenzene	5.5	U	5.5	0.33	.85	NA	9/20/12 21:43		310427	
Chloroethane	5.5	U	5.5	3.2	.85	NA	9/20/12 21:43		310427	
Chloroform	5.5	U	5.5	1.4	.85	NA	9/20/12 21:43		310427	
Chloromethane	5.5	U	5.5	0.45	.85	NA	9/20/12 21:43		310427	
Dibromochloromethane	5.5	U	5.5	0.81	.85	NA	9/20/12 21:43		310427	
Dichloromethane	5.5	U	5.5	0.64	.85	NA	9/20/12 21:43		310427	
Ethylbenzene	5.5	U	5.5	0.26	.85	NA	9/20/12 21:43		310427	
Styrene	5.5	U	5.5	0.34	.85	NA	9/20/12 21:43		310427	
Tetrachloroethene (PCE)	5.5	U	5.5	0.98	.85	NA	9/20/12 21:43		310427	
Toluene	1.6	I	5.5	0.75	.85	NA	9/20/12 21:43		310427	
Trichloroethene (TCE)	1.8	I	5.5	1.2	.85	NA	9/20/12 21:43		310427	
Vinyl Chloride	67		5.5	2.1	.85	NA	9/20/12 21:43		310427	
cis-1,2-Dichloroethene	2.5	I	5.5	1.1	.85	NA	9/20/12 21:43		310427	
cis-1,3-Dichloropropene	5.5	U	5.5	1.0	.85	NA	9/20/12 21:43		310427	
m,p-Xylenes	11	U	11	1.3	.85	NA	9/20/12 21:43		310427	
n-Butyl Acetate	5.5	U	5.5	0.91	.85	NA	9/20/12 21:43		310427	
o-Xylene	5.5	U	5.5	0.54	.85	NA	9/20/12 21:43		310427	
trans-1,2-Dichloroethene	1.6	I	5.5	0.96	.85	NA	9/20/12 21:43		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0349-053.0-20120910
Lab Code: R1206036-018

Service Request: R1206036
Date Collected: 9/10/12 1148
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 76.9

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	5.5	U	5.5	0.23	.85	NA	9/20/12 21:43		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	28-150	9/20/12 21:43	
Dibromofluoromethane	102	63-138	9/20/12 21:43	
Toluene-d8	99	66-138	9/20/12 21:43	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-037.0-20120910
Lab Code: R1206036-019

Service Request: R1206036
Date Collected: 9/10/12 1352
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	83.1	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-037.0-20120910
Lab Code: R1206036-019

Service Request: R1206036
Date Collected: 9/10/12 1352
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 83.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	550	U	550	42	91	NA	9/19/12 10:01		309793	
1,1,2,2-Tetrachloroethane	550	U	550	22	91	NA	9/19/12 10:01		309793	
1,1,2-Trichloroethane	550	U	550	45	91	NA	9/19/12 10:01		309793	
1,1-Dichloroethane (1,1-DCA)	550	U	550	34	91	NA	9/19/12 10:01		309793	
1,1-Dichloroethene (1,1-DCE)	550	U	550	59	91	NA	9/19/12 10:01		309793	
1,2-Dichloroethane	550	U	550	36	91	NA	9/19/12 10:01		309793	
1,2-Dichloropropane	550	U	550	42	91	NA	9/19/12 10:01		309793	
n-Butanol	27000	U	27000	5500	91	NA	9/19/12 10:01		309793	
2-Butanone (MEK)	550	U	550	170	91	NA	9/19/12 10:01		309793	
2-Hexanone	550	U	550	64	91	NA	9/19/12 10:01		309793	
4-Methyl-2-pentanone	550	U	550	55	91	NA	9/19/12 10:01		309793	
Acetone	550	U	550	120	91	NA	9/19/12 10:01		309793	
Benzene	550	U	550	30	91	NA	9/19/12 10:01		309793	
Bromodichloromethane	550	U	550	28	91	NA	9/19/12 10:01		309793	
Bromoform	550	U	550	72	91	NA	9/19/12 10:01		309793	
Bromomethane	64	IV	550	50	91	NA	9/19/12 10:01		309793	
Carbon Disulfide	67	I	550	33	91	NA	9/19/12 10:01		309793	
Carbon Tetrachloride	550	U	550	29	91	NA	9/19/12 10:01		309793	
Chlorobenzene	550	U	550	31	91	NA	9/19/12 10:01		309793	
Chloroethane	550	U	550	42	91	NA	9/19/12 10:01		309793	
Chloroform	550	U	550	48	91	NA	9/19/12 10:01		309793	
Chloromethane	550	U	550	51	91	NA	9/19/12 10:01		309793	
Dibromochloromethane	550	U	550	26	91	NA	9/19/12 10:01		309793	
Dichloromethane	550	U	550	51	91	NA	9/19/12 10:01		309793	
Ethylbenzene	550	U	550	34	91	NA	9/19/12 10:01		309793	
Styrene	550	U	550	22	91	NA	9/19/12 10:01		309793	
Tetrachloroethene (PCE)	550	U	550	22	91	NA	9/19/12 10:01		309793	
Toluene	550	U	550	38	91	NA	9/19/12 10:01		309793	
Trichloroethene (TCE)	5000		550	22	91	NA	9/19/12 10:01		309793	
Vinyl Chloride	2100		550	36	91	NA	9/19/12 10:01		309793	
cis-1,2-Dichloroethene	4200		550	28	91	NA	9/19/12 10:01		309793	
cis-1,3-Dichloropropene	550	U	550	29	91	NA	9/19/12 10:01		309793	
m,p-Xylenes	1100	U	1100	60	91	NA	9/19/12 10:01		309793	
n-Butyl Acetate	550	U	550	26	91	NA	9/19/12 10:01		309793	
o-Xylene	550	U	550	32	91	NA	9/19/12 10:01		309793	
trans-1,2-Dichloroethene	110	I	550	42	91	NA	9/19/12 10:01		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-037.0-20120910
Lab Code: R1206036-019

Service Request: R1206036
Date Collected: 9/10/12 1352
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 83.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	550	U	550	27	91	NA	9/19/12 10:01		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	98	85-122	9/19/12 10:01	
Dibromofluoromethane	101	89-119	9/19/12 10:01	
Toluene-d8	98	87-121	9/19/12 10:01	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-040.0-20120910
Lab Code: R1206036-020

Service Request: R1206036
Date Collected: 9/10/12 1411
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	81.1	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-040.0-20120910
Lab Code: R1206036-020

Service Request: R1206036
Date Collected: 9/10/12 1411
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 81.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	610	U	610	47	98.5	NA	9/19/12 10:34		309793	
1,1,2,2-Tetrachloroethane	610	U	610	25	98.5	NA	9/19/12 10:34		309793	
1,1,2-Trichloroethane	610	U	610	50	98.5	NA	9/19/12 10:34		309793	
1,1-Dichloroethane (1,1-DCA)	610	U	610	38	98.5	NA	9/19/12 10:34		309793	
1,1-Dichloroethene (1,1-DCE)	610	U	610	65	98.5	NA	9/19/12 10:34		309793	
1,2-Dichloroethane	610	U	610	39	98.5	NA	9/19/12 10:34		309793	
1,2-Dichloropropane	610	U	610	47	98.5	NA	9/19/12 10:34		309793	
n-Butanol	30000	U	30000	6100	98.5	NA	9/19/12 10:34		309793	
2-Butanone (MEK)	610	U	610	190	98.5	NA	9/19/12 10:34		309793	
2-Hexanone	610	U	610	71	98.5	NA	9/19/12 10:34		309793	
4-Methyl-2-pentanone	610	U	610	61	98.5	NA	9/19/12 10:34		309793	
Acetone	610	U	610	140	98.5	NA	9/19/12 10:34		309793	
Benzene	610	U	610	33	98.5	NA	9/19/12 10:34		309793	
Bromodichloromethane	610	U	610	31	98.5	NA	9/19/12 10:34		309793	
Bromoform	610	U	610	79	98.5	NA	9/19/12 10:34		309793	
Bromomethane	77	IV	610	55	98.5	NA	9/19/12 10:34		309793	
Carbon Disulfide	69	I	610	37	98.5	NA	9/19/12 10:34		309793	
Carbon Tetrachloride	610	U	610	32	98.5	NA	9/19/12 10:34		309793	
Chlorobenzene	610	U	610	35	98.5	NA	9/19/12 10:34		309793	
Chloroethane	610	U	610	47	98.5	NA	9/19/12 10:34		309793	
Chloroform	610	U	610	53	98.5	NA	9/19/12 10:34		309793	
Chloromethane	610	U	610	56	98.5	NA	9/19/12 10:34		309793	
Dibromochloromethane	610	U	610	28	98.5	NA	9/19/12 10:34		309793	
Dichloromethane	610	U	610	56	98.5	NA	9/19/12 10:34		309793	
Ethylbenzene	610	U	610	38	98.5	NA	9/19/12 10:34		309793	
Styrene	610	U	610	25	98.5	NA	9/19/12 10:34		309793	
Tetrachloroethene (PCE)	610	U	610	25	98.5	NA	9/19/12 10:34		309793	
Toluene	610	U	610	42	98.5	NA	9/19/12 10:34		309793	
Trichloroethene (TCE)	1100		610	25	98.5	NA	9/19/12 10:34		309793	
Vinyl Chloride	960		610	39	98.5	NA	9/19/12 10:34		309793	
cis-1,2-Dichloroethene	730		610	31	98.5	NA	9/19/12 10:34		309793	
cis-1,3-Dichloropropene	610	U	610	32	98.5	NA	9/19/12 10:34		309793	
m,p-Xylenes	1200	U	1200	66	98.5	NA	9/19/12 10:34		309793	
n-Butyl Acetate	610	U	610	28	98.5	NA	9/19/12 10:34		309793	
o-Xylene	610	U	610	36	98.5	NA	9/19/12 10:34		309793	
trans-1,2-Dichloroethene	610	U	610	47	98.5	NA	9/19/12 10:34		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-040.0-20120910
Lab Code: R1206036-020

Service Request: R1206036
Date Collected: 9/10/12 1411
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 81.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	610	U	610	30	98.5	NA	9/19/12 10:34		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85-122	9/19/12 10:34	
Dibromofluoromethane	102	89-119	9/19/12 10:34	
Toluene-d8	98	87-121	9/19/12 10:34	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-044.0-20120910
Lab Code: R1206036-021

Service Request: R1206036
Date Collected: 9/10/12 1418
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.1	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-044.0-20120910
Lab Code: R1206036-021

Service Request: R1206036
Date Collected: 9/10/12 1418
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	700	U	700	54	102.5	NA	9/19/12 11:07		309793	
1,1,2,2-Tetrachloroethane	700	U	700	29	102.5	NA	9/19/12 11:07		309793	
1,1,2-Trichloroethane	700	U	700	58	102.5	NA	9/19/12 11:07		309793	
1,1-Dichloroethane (1,1-DCA)	700	U	700	44	102.5	NA	9/19/12 11:07		309793	
1,1-Dichloroethene (1,1-DCE)	700	U	700	75	102.5	NA	9/19/12 11:07		309793	
1,2-Dichloroethane	700	U	700	45	102.5	NA	9/19/12 11:07		309793	
1,2-Dichloropropane	700	U	700	54	102.5	NA	9/19/12 11:07		309793	
n-Butanol	35000	U	35000	7100	102.5	NA	9/19/12 11:07		309793	
2-Butanone (MEK)	700	U	700	220	102.5	NA	9/19/12 11:07		309793	
2-Hexanone	700	U	700	82	102.5	NA	9/19/12 11:07		309793	
4-Methyl-2-pentanone	700	U	700	71	102.5	NA	9/19/12 11:07		309793	
Acetone	700	U	700	160	102.5	NA	9/19/12 11:07		309793	
Benzene	700	U	700	38	102.5	NA	9/19/12 11:07		309793	
Bromodichloromethane	700	U	700	36	102.5	NA	9/19/12 11:07		309793	
Bromoform	700	U	700	92	102.5	NA	9/19/12 11:07		309793	
Bromomethane	86	IV	700	64	102.5	NA	9/19/12 11:07		309793	
Carbon Disulfide	49	I	700	43	102.5	NA	9/19/12 11:07		309793	
Carbon Tetrachloride	700	U	700	37	102.5	NA	9/19/12 11:07		309793	
Chlorobenzene	700	U	700	40	102.5	NA	9/19/12 11:07		309793	
Chloroethane	700	U	700	54	102.5	NA	9/19/12 11:07		309793	
Chloroform	700	U	700	61	102.5	NA	9/19/12 11:07		309793	
Chloromethane	700	U	700	65	102.5	NA	9/19/12 11:07		309793	
Dibromochloromethane	700	U	700	33	102.5	NA	9/19/12 11:07		309793	
Dichloromethane	700	U	700	65	102.5	NA	9/19/12 11:07		309793	
Ethylbenzene	700	U	700	44	102.5	NA	9/19/12 11:07		309793	
Styrene	700	U	700	29	102.5	NA	9/19/12 11:07		309793	
Tetrachloroethene (PCE)	700	U	700	29	102.5	NA	9/19/12 11:07		309793	
Toluene	700	U	700	48	102.5	NA	9/19/12 11:07		309793	
Trichloroethene (TCE)	4800		700	29	102.5	NA	9/19/12 11:07		309793	
Vinyl Chloride	2200		700	45	102.5	NA	9/19/12 11:07		309793	
cis-1,2-Dichloroethene	3300		700	36	102.5	NA	9/19/12 11:07		309793	
cis-1,3-Dichloropropene	700	U	700	37	102.5	NA	9/19/12 11:07		309793	
m,p-Xylenes	1400	U	1400	76	102.5	NA	9/19/12 11:07		309793	
n-Butyl Acetate	700	U	700	33	102.5	NA	9/19/12 11:07		309793	
o-Xylene	700	U	700	41	102.5	NA	9/19/12 11:07		309793	
trans-1,2-Dichloroethene	70	I	700	54	102.5	NA	9/19/12 11:07		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-044.0-20120910
Lab Code: R1206036-021

Service Request: R1206036
Date Collected: 9/10/12 1418
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	700 U	700	34	102.5	NA	9/19/12 11:07		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	9/19/12 11:07	
Dibromofluoromethane	103	89-119	9/19/12 11:07	
Toluene-d8	99	87-121	9/19/12 11:07	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-045.5-20120910
Lab Code: R1206036-022

Service Request: R1206036
Date Collected: 9/10/12 1441
Date Received: 9/12/12

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	73.1	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-045.5-20120910
Lab Code: R1206036-022

Service Request: R1206036
Date Collected: 9/10/12 1441
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	2200	U	2200	170	318	NA	9/19/12 12:12		309793	
1,1,2,2-Tetrachloroethane	2200	U	2200	88	318	NA	9/19/12 12:12		309793	
1,1,2-Trichloroethane	2200	U	2200	180	318	NA	9/19/12 12:12		309793	
1,1-Dichloroethane (1,1-DCA)	2200	U	2200	140	318	NA	9/19/12 12:12		309793	
1,1-Dichloroethene (1,1-DCE)	2200	U	2200	240	318	NA	9/19/12 12:12		309793	
1,2-Dichloroethane	2200	U	2200	140	318	NA	9/19/12 12:12		309793	
1,2-Dichloropropane	2200	U	2200	170	318	NA	9/19/12 12:12		309793	
n-Butanol	110000	U	110000	22000	318	NA	9/19/12 12:12		309793	
2-Butanone (MEK)	2200	U	2200	670	318	NA	9/19/12 12:12		309793	
2-Hexanone	2200	U	2200	260	318	NA	9/19/12 12:12		309793	
4-Methyl-2-pentanone	2200	U	2200	220	318	NA	9/19/12 12:12		309793	
Acetone	2200	U	2200	480	318	NA	9/19/12 12:12		309793	
Benzene	2200	U	2200	120	318	NA	9/19/12 12:12		309793	
Bromodichloromethane	2200	U	2200	110	318	NA	9/19/12 12:12		309793	
Bromoform	2200	U	2200	290	318	NA	9/19/12 12:12		309793	
Bromomethane	2200	U	2200	200	318	NA	9/19/12 12:12		309793	
Carbon Disulfide	2200	U	2200	140	318	NA	9/19/12 12:12		309793	
Carbon Tetrachloride	2200	U	2200	120	318	NA	9/19/12 12:12		309793	
Chlorobenzene	2200	U	2200	130	318	NA	9/19/12 12:12		309793	
Chloroethane	2200	U	2200	170	318	NA	9/19/12 12:12		309793	
Chloroform	2200	U	2200	190	318	NA	9/19/12 12:12		309793	
Chloromethane	2200	U	2200	210	318	NA	9/19/12 12:12		309793	
Dibromochloromethane	2200	U	2200	110	318	NA	9/19/12 12:12		309793	
Dichloromethane	2200	U	2200	210	318	NA	9/19/12 12:12		309793	
Ethylbenzene	2200	U	2200	140	318	NA	9/19/12 12:12		309793	
Styrene	2200	U	2200	88	318	NA	9/19/12 12:12		309793	
Tetrachloroethene (PCE)	2200	U	2200	88	318	NA	9/19/12 12:12		309793	
Toluene	2200	U	2200	150	318	NA	9/19/12 12:12		309793	
Trichloroethene (TCE)	75000		2200	88	318	NA	9/19/12 12:12		309793	
Vinyl Chloride	2200	U	2200	140	318	NA	9/19/12 12:12		309793	
cis-1,2-Dichloroethene	2700		2200	110	318	NA	9/19/12 12:12		309793	
cis-1,3-Dichloropropene	2200	U	2200	120	318	NA	9/19/12 12:12		309793	
m,p-Xylenes	4400	U	4400	240	318	NA	9/19/12 12:12		309793	
n-Butyl Acetate	2200	U	2200	110	318	NA	9/19/12 12:12		309793	
o-Xylene	2200	U	2200	130	318	NA	9/19/12 12:12		309793	
trans-1,2-Dichloroethene	2200	U	2200	170	318	NA	9/19/12 12:12		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: LC34-DPT0350-045.5-20120910
Lab Code: R1206036-022

Service Request: R1206036
Date Collected: 9/10/12 1441
Date Received: 9/12/12
Units: µg/Kg
Basis: Dry
Percent Solids: 73.1

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	2200	U	2200	110	318	NA	9/19/12 12:12		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	97	85-122	9/19/12 12:12	
Dibromofluoromethane	100	89-119	9/19/12 12:12	
Toluene-d8	98	87-121	9/19/12 12:12	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1206036-MB1

Service Request: R1206036
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	9/24/12 16:03	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: R1206036-MB2

Service Request: R1206036
Date Collected: NA
Date Received: NA

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0 U	Percent	1.0	1	NA	9/24/12 18:32	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1210798-04

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.38	1	NA	9/14/12 20:48		309582	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.20	1	NA	9/14/12 20:48		309582	
1,1,2-Trichloroethane	5.0	U	5.0	0.41	1	NA	9/14/12 20:48		309582	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	0.31	1	NA	9/14/12 20:48		309582	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	0.53	1	NA	9/14/12 20:48		309582	
1,2-Dichloroethane	5.0	U	5.0	0.32	1	NA	9/14/12 20:48		309582	
1,2-Dichloropropane	5.0	U	5.0	0.38	1	NA	9/14/12 20:48		309582	
n-Butanol	250	U	250	50	1	NA	9/14/12 20:48		309582	
2-Butanone (MEK)	5.0	U	5.0	1.6	1	NA	9/14/12 20:48		309582	
2-Hexanone	5.0	U	5.0	0.58	1	NA	9/14/12 20:48		309582	
4-Methyl-2-pentanone	5.0	U	5.0	0.50	1	NA	9/14/12 20:48		309582	
Acetone	5.0	U	5.0	1.1	1	NA	9/14/12 20:48		309582	
Benzene	5.0	U	5.0	0.27	1	NA	9/14/12 20:48		309582	
Bromodichloromethane	5.0	U	5.0	0.25	1	NA	9/14/12 20:48		309582	
Bromoform	5.0	U	5.0	0.65	1	NA	9/14/12 20:48		309582	
Bromomethane	5.0	U	5.0	0.45	1	NA	9/14/12 20:48		309582	
Carbon Disulfide	5.0	U	5.0	0.30	1	NA	9/14/12 20:48		309582	
Carbon Tetrachloride	5.0	U	5.0	0.26	1	NA	9/14/12 20:48		309582	
Chlorobenzene	5.0	U	5.0	0.28	1	NA	9/14/12 20:48		309582	
Chloroethane	5.0	U	5.0	0.38	1	NA	9/14/12 20:48		309582	
Chloroform	5.0	U	5.0	0.43	1	NA	9/14/12 20:48		309582	
Chloromethane	5.0	U	5.0	0.46	1	NA	9/14/12 20:48		309582	
Dibromochloromethane	5.0	U	5.0	0.23	1	NA	9/14/12 20:48		309582	
Dichloromethane	5.0	U	5.0	0.46	1	NA	9/14/12 20:48		309582	
Ethylbenzene	5.0	U	5.0	0.31	1	NA	9/14/12 20:48		309582	
Styrene	5.0	U	5.0	0.20	1	NA	9/14/12 20:48		309582	
Tetrachloroethene (PCE)	5.0	U	5.0	0.20	1	NA	9/14/12 20:48		309582	
Toluene	5.0	U	5.0	0.34	1	NA	9/14/12 20:48		309582	
Trichloroethene (TCE)	5.0	U	5.0	0.20	1	NA	9/14/12 20:48		309582	
Vinyl Chloride	5.0	U	5.0	0.32	1	NA	9/14/12 20:48		309582	
cis-1,2-Dichloroethene	5.0	U	5.0	0.25	1	NA	9/14/12 20:48		309582	
cis-1,3-Dichloropropene	5.0	U	5.0	0.26	1	NA	9/14/12 20:48		309582	
m,p-Xylenes	10	U	10	0.54	1	NA	9/14/12 20:48		309582	
n-Butyl Acetate	5.0	U	5.0	0.23	1	NA	9/14/12 20:48		309582	
o-Xylene	5.0	U	5.0	0.29	1	NA	9/14/12 20:48		309582	
trans-1,2-Dichloroethene	5.0	U	5.0	0.38	1	NA	9/14/12 20:48		309582	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1210798-04

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	5.0	U	5.0	0.24	1	NA	9/14/12 20:48		309582	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	9/14/12 20:48	
Dibromofluoromethane	104	89-119	9/14/12 20:48	
Toluene-d8	97	87-121	9/14/12 20:48	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1210886-04

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	19	50.	NA	9/19/12 06:44		309793	
1,1,2,2-Tetrachloroethane	250	U	250	10	50.	NA	9/19/12 06:44		309793	
1,1,2-Trichloroethane	250	U	250	21	50.	NA	9/19/12 06:44		309793	
1,1-Dichloroethane (1,1-DCA)	250	U	250	16	50.	NA	9/19/12 06:44		309793	
1,1-Dichloroethene (1,1-DCE)	250	U	250	27	50.	NA	9/19/12 06:44		309793	
1,2-Dichloroethane	250	U	250	16	50.	NA	9/19/12 06:44		309793	
1,2-Dichloropropane	250	U	250	19	50.	NA	9/19/12 06:44		309793	
n-Butanol	13000	U	13000	2500	50.	NA	9/19/12 06:44		309793	
2-Butanone (MEK)	250	U	250	77	50.	NA	9/19/12 06:44		309793	
2-Hexanone	250	U	250	29	50.	NA	9/19/12 06:44		309793	
4-Methyl-2-pentanone	250	U	250	25	50.	NA	9/19/12 06:44		309793	
Acetone	250	U	250	55	50.	NA	9/19/12 06:44		309793	
Benzene	250	U	250	14	50.	NA	9/19/12 06:44		309793	
Bromodichloromethane	250	U	250	13	50.	NA	9/19/12 06:44		309793	
Bromoform	250	U	250	33	50.	NA	9/19/12 06:44		309793	
Bromomethane	49	I	250	23	50.	NA	9/19/12 06:44		309793	
Carbon Disulfide	250	U	250	15	50.	NA	9/19/12 06:44		309793	
Carbon Tetrachloride	250	U	250	13	50.	NA	9/19/12 06:44		309793	
Chlorobenzene	250	U	250	15	50.	NA	9/19/12 06:44		309793	
Chloroethane	250	U	250	19	50.	NA	9/19/12 06:44		309793	
Chloroform	250	U	250	22	50.	NA	9/19/12 06:44		309793	
Chloromethane	250	U	250	23	50.	NA	9/19/12 06:44		309793	
Dibromochloromethane	250	U	250	12	50.	NA	9/19/12 06:44		309793	
Dichloromethane	250	U	250	23	50.	NA	9/19/12 06:44		309793	
Ethylbenzene	250	U	250	16	50.	NA	9/19/12 06:44		309793	
Styrene	250	U	250	10	50.	NA	9/19/12 06:44		309793	
Tetrachloroethene (PCE)	250	U	250	10	50.	NA	9/19/12 06:44		309793	
Toluene	250	U	250	17	50.	NA	9/19/12 06:44		309793	
Trichloroethene (TCE)	250	U	250	10	50.	NA	9/19/12 06:44		309793	
Vinyl Chloride	250	U	250	16	50.	NA	9/19/12 06:44		309793	
cis-1,2-Dichloroethene	250	U	250	13	50.	NA	9/19/12 06:44		309793	
cis-1,3-Dichloropropene	250	U	250	13	50.	NA	9/19/12 06:44		309793	
m,p-Xylenes	500	U	500	27	50.	NA	9/19/12 06:44		309793	
n-Butyl Acetate	250	U	250	12	50.	NA	9/19/12 06:44		309793	
o-Xylene	250	U	250	15	50.	NA	9/19/12 06:44		309793	
trans-1,2-Dichloroethene	250	U	250	19	50.	NA	9/19/12 06:44		309793	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1210886-04

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	250	U	250	12	50.	NA	9/19/12 06:44		309793	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	100	85-122	9/19/12 06:44	
Dibromofluoromethane	104	89-119	9/19/12 06:44	
Toluene-d8	101	87-121	9/19/12 06:44	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211090-05

Service Request: R1206036
Date Collected: NA
Date Received: NA

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	0.73	1	NA	9/20/12 17:58		310427	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	0.81	1	NA	9/20/12 17:58		310427	
1,1,2-Trichloroethane	5.0	U	5.0	0.73	1	NA	9/20/12 17:58		310427	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1.3	1	NA	9/20/12 17:58		310427	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1.3	1	NA	9/20/12 17:58		310427	
1,2-Dichloroethane	5.0	U	5.0	0.61	1	NA	9/20/12 17:58		310427	
1,2-Dichloropropane	5.0	U	5.0	0.97	1	NA	9/20/12 17:58		310427	
n-Butanol	250	U	250	53	1	NA	9/20/12 17:58		310427	
2-Butanone (MEK)	5.0	U	5.0	2.3	1	NA	9/20/12 17:58		310427	
2-Hexanone	5.0	U	5.0	1.3	1	NA	9/20/12 17:58		310427	
4-Methyl-2-pentanone	5.0	U	5.0	0.98	1	NA	9/20/12 17:58		310427	
Acetone	5.0	U	5.0	2.9	1	NA	9/20/12 17:58		310427	
Benzene	5.0	U	5.0	0.29	1	NA	9/20/12 17:58		310427	
Bromodichloromethane	5.0	U	5.0	0.61	1	NA	9/20/12 17:58		310427	
Bromoform	5.0	U	5.0	0.93	1	NA	9/20/12 17:58		310427	
Bromomethane	5.0	U	5.0	1.4	1	NA	9/20/12 17:58		310427	
Carbon Disulfide	5.0	U	5.0	1.3	1	NA	9/20/12 17:58		310427	
Carbon Tetrachloride	5.0	U	5.0	0.92	1	NA	9/20/12 17:58		310427	
Chlorobenzene	5.0	U	5.0	0.29	1	NA	9/20/12 17:58		310427	
Chloroethane	5.0	U	5.0	2.9	1	NA	9/20/12 17:58		310427	
Chloroform	5.0	U	5.0	1.3	1	NA	9/20/12 17:58		310427	
Chloromethane	5.0	U	5.0	0.40	1	NA	9/20/12 17:58		310427	
Dibromochloromethane	5.0	U	5.0	0.73	1	NA	9/20/12 17:58		310427	
Dichloromethane	5.0	U	5.0	0.57	1	NA	9/20/12 17:58		310427	
Ethylbenzene	5.0	U	5.0	0.23	1	NA	9/20/12 17:58		310427	
Styrene	5.0	U	5.0	0.30	1	NA	9/20/12 17:58		310427	
Tetrachloroethene (PCE)	5.0	U	5.0	0.88	1	NA	9/20/12 17:58		310427	
Toluene	5.0	U	5.0	0.67	1	NA	9/20/12 17:58		310427	
Trichloroethene (TCE)	5.0	U	5.0	1.1	1	NA	9/20/12 17:58		310427	
Vinyl Chloride	5.0	U	5.0	1.9	1	NA	9/20/12 17:58		310427	
cis-1,2-Dichloroethene	5.0	U	5.0	0.95	1	NA	9/20/12 17:58		310427	
cis-1,3-Dichloropropene	5.0	U	5.0	0.90	1	NA	9/20/12 17:58		310427	
m,p-Xylenes	10	U	10	1.1	1	NA	9/20/12 17:58		310427	
n-Butyl Acetate	5.0	U	5.0	0.82	1	NA	9/20/12 17:58		310427	
o-Xylene	5.0	U	5.0	0.48	1	NA	9/20/12 17:58		310427	
trans-1,2-Dichloroethene	5.0	U	5.0	0.86	1	NA	9/20/12 17:58		310427	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211090-05

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	5.0 U	5.0	0.20	1	NA	9/20/12 17:58		310427	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	102	85-122	9/20/12 17:58	
Dibromofluoromethane	102	89-119	9/20/12 17:58	
Toluene-d8	102	87-121	9/20/12 17:58	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211268-01

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	19	50	NA	9/20/12 15:38		310398	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	9/20/12 15:38		310398	
1,1,2-Trichloroethane	250	U	250	21	50	NA	9/20/12 15:38		310398	
1,1-Dichloroethane (1,1-DCA)	250	U	250	16	50	NA	9/20/12 15:38		310398	
1,1-Dichloroethene (1,1-DCE)	250	U	250	27	50	NA	9/20/12 15:38		310398	
1,2-Dichloroethane	250	U	250	16	50	NA	9/20/12 15:38		310398	
1,2-Dichloropropane	250	U	250	19	50	NA	9/20/12 15:38		310398	
n-Butanol	13000	U	13000	2500	50	NA	9/20/12 15:38		310398	
2-Butanone (MEK)	250	U	250	77	50	NA	9/20/12 15:38		310398	
2-Hexanone	250	U	250	29	50	NA	9/20/12 15:38		310398	
4-Methyl-2-pentanone	250	U	250	25	50	NA	9/20/12 15:38		310398	
Acetone	250	U	250	55	50	NA	9/20/12 15:38		310398	
Benzene	250	U	250	14	50	NA	9/20/12 15:38		310398	
Bromodichloromethane	250	U	250	13	50	NA	9/20/12 15:38		310398	
Bromoform	250	U	250	33	50	NA	9/20/12 15:38		310398	
Bromomethane	250	U	250	23	50	NA	9/20/12 15:38		310398	
Carbon Disulfide	250	U	250	15	50	NA	9/20/12 15:38		310398	
Carbon Tetrachloride	250	U	250	13	50	NA	9/20/12 15:38		310398	
Chlorobenzene	250	U	250	15	50	NA	9/20/12 15:38		310398	
Chloroethane	250	U	250	19	50	NA	9/20/12 15:38		310398	
Chloroform	250	U	250	22	50	NA	9/20/12 15:38		310398	
Chloromethane	250	U	250	23	50	NA	9/20/12 15:38		310398	
Dibromochloromethane	250	U	250	12	50	NA	9/20/12 15:38		310398	
Dichloromethane	250	U	250	23	50	NA	9/20/12 15:38		310398	
Ethylbenzene	250	U	250	16	50	NA	9/20/12 15:38		310398	
Styrene	250	U	250	10	50	NA	9/20/12 15:38		310398	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	9/20/12 15:38		310398	
Toluene	250	U	250	17	50	NA	9/20/12 15:38		310398	
Trichloroethene (TCE)	250	U	250	10	50	NA	9/20/12 15:38		310398	
Vinyl Chloride	250	U	250	16	50	NA	9/20/12 15:38		310398	
cis-1,2-Dichloroethene	250	U	250	13	50	NA	9/20/12 15:38		310398	
cis-1,3-Dichloropropene	250	U	250	13	50	NA	9/20/12 15:38		310398	
m,p-Xylenes	500	U	500	27	50	NA	9/20/12 15:38		310398	
n-Butyl Acetate	250	U	250	12	50	NA	9/20/12 15:38		310398	
o-Xylene	250	U	250	15	50	NA	9/20/12 15:38		310398	
trans-1,2-Dichloroethene	250	U	250	19	50	NA	9/20/12 15:38		310398	



COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211268-01

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	250	U	250	12	50	NA	9/20/12 15:38		310398	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85-122	9/20/12 15:38	
Dibromofluoromethane	99	89-119	9/20/12 15:38	
Toluene-d8	97	87-121	9/20/12 15:38	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211272-01

Service Request: R1206036
Date Collected: NA
Date Received: NA

Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
1,1,1-Trichloroethane (TCA)	250	U	250	19	50	NA	9/21/12 12:20		310599	
1,1,2,2-Tetrachloroethane	250	U	250	10	50	NA	9/21/12 12:20		310599	
1,1,2-Trichloroethane	250	U	250	21	50	NA	9/21/12 12:20		310599	
1,1-Dichloroethane (1,1-DCA)	250	U	250	16	50	NA	9/21/12 12:20		310599	
1,1-Dichloroethene (1,1-DCE)	250	U	250	27	50	NA	9/21/12 12:20		310599	
1,2-Dichloroethane	250	U	250	16	50	NA	9/21/12 12:20		310599	
1,2-Dichloropropane	250	U	250	19	50	NA	9/21/12 12:20		310599	
n-Butanol	13000	U	13000	2500	50	NA	9/21/12 12:20		310599	
2-Butanone (MEK)	250	U	250	77	50	NA	9/21/12 12:20		310599	
2-Hexanone	250	U	250	29	50	NA	9/21/12 12:20		310599	
4-Methyl-2-pentanone	250	U	250	25	50	NA	9/21/12 12:20		310599	
Acetone	250	U	250	55	50	NA	9/21/12 12:20		310599	
Benzene	250	U	250	14	50	NA	9/21/12 12:20		310599	
Bromodichloromethane	250	U	250	13	50	NA	9/21/12 12:20		310599	
Bromoform	250	U	250	33	50	NA	9/21/12 12:20		310599	
Bromomethane	250	U	250	23	50	NA	9/21/12 12:20		310599	
Carbon Disulfide	250	U	250	15	50	NA	9/21/12 12:20		310599	
Carbon Tetrachloride	250	U	250	13	50	NA	9/21/12 12:20		310599	
Chlorobenzene	250	U	250	15	50	NA	9/21/12 12:20		310599	
Chloroethane	250	U	250	19	50	NA	9/21/12 12:20		310599	
Chloroform	250	U	250	22	50	NA	9/21/12 12:20		310599	
Chloromethane	250	U	250	23	50	NA	9/21/12 12:20		310599	
Dibromochloromethane	250	U	250	12	50	NA	9/21/12 12:20		310599	
Dichloromethane	250	U	250	23	50	NA	9/21/12 12:20		310599	
Ethylbenzene	250	U	250	16	50	NA	9/21/12 12:20		310599	
Styrene	250	U	250	10	50	NA	9/21/12 12:20		310599	
Tetrachloroethene (PCE)	250	U	250	10	50	NA	9/21/12 12:20		310599	
Toluene	250	U	250	17	50	NA	9/21/12 12:20		310599	
Trichloroethene (TCE)	250	U	250	10	50	NA	9/21/12 12:20		310599	
Vinyl Chloride	250	U	250	16	50	NA	9/21/12 12:20		310599	
cis-1,2-Dichloroethene	250	U	250	13	50	NA	9/21/12 12:20		310599	
cis-1,3-Dichloropropene	250	U	250	13	50	NA	9/21/12 12:20		310599	
m,p-Xylenes	500	U	500	27	50	NA	9/21/12 12:20		310599	
n-Butyl Acetate	250	U	250	12	50	NA	9/21/12 12:20		310599	
o-Xylene	250	U	250	15	50	NA	9/21/12 12:20		310599	
trans-1,2-Dichloroethene	250	U	250	19	50	NA	9/21/12 12:20		310599	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group
Analytical Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: RQ1211272-01

Service Request: R1206036
Date Collected: NA
Date Received: NA
Units: µg/Kg
Basis: Dry

Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Analysis Lot	Note
trans-1,3-Dichloropropene	250	U	250	12	50	NA	9/21/12 12:20		310599	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	96	85-122	9/21/12 12:20	
Dibromofluoromethane	96	89-119	9/21/12 12:20	
Toluene-d8	98	87-121	9/21/12 12:20	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/14/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 309582

**Lab Control Sample
 RQ1210798-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	20.2	20.0	101	67 - 121
1,1,2,2-Tetrachloroethane	18.7	20.0	93	72 - 124
1,1,2-Trichloroethane	19.3	20.0	97	81 - 117
1,1-Dichloroethane (1,1-DCA)	20.5	20.0	103	76 - 124
1,1-Dichloroethene (1,1-DCE)	20.4	20.0	102	67 - 119
1,2-Dichloroethane	20.8	20.0	104	72 - 130
1,2-Dichloropropane	20.6	20.0	103	83 - 119
n-Butanol	704	1010	70	49 - 182
2-Butanone (MEK)	17.2	20.0	86	60 - 133
2-Hexanone	16.6	20.0	83	61 - 131
4-Methyl-2-pentanone	18.1	20.0	91	61 - 132
Acetone	18.1	20.0	91	64 - 133
Benzene	20.7	20.0	103	78 - 118
Bromodichloromethane	21.7	20.0	108	79 - 123
Bromoform	22.0	20.0	110	69 - 126
Bromomethane	16.4	20.0	82	49 - 124
Carbon Disulfide	22.2	20.0	111	67 - 138
Carbon Tetrachloride	22.9	20.0	115	64 - 129
Chlorobenzene	20.6	20.0	103	80 - 121
Chloroethane	17.6	20.0	88	72 - 130
Chloroform	20.1	20.0	101	75 - 123
Chloromethane	15.8	20.0	79	55 - 139
Dibromochloromethane	22.6	20.0	113	78 - 127
Dichloromethane	19.6	20.0	98	73 - 122
Ethylbenzene	19.6	20.0	98	75 - 123
Styrene	20.1	20.0	101	80 - 121
Tetrachloroethene (PCE)	21.6	20.0	108	71 - 127
Toluene	20.9	20.0	104	77 - 120
Trichloroethene (TCE)	21.1	20.0	106	75 - 122
Vinyl Chloride	18.4	20.0	92	68 - 139
cis-1,2-Dichloroethene	20.1	20.0	100	77 - 123
cis-1,3-Dichloropropene	19.5	20.0	97	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/14/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 309582

Lab Control Sample
RQ1210798-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	41.2	40.0	103	77 - 124
n-Butyl Acetate	18.3	20.0	92	61 - 126
o-Xylene	20.1	20.0	101	77 - 131
trans-1,2-Dichloroethene	20.1	20.0	100	72 - 120
trans-1,3-Dichloropropene	19.9	20.0	100	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/19/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 309793

**Lab Control Sample
 RQ1210886-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	22.9	20.0	115	67 - 121
1,1,2,2-Tetrachloroethane	20.3	20.0	102	72 - 124
1,1,2-Trichloroethane	20.3	20.0	101	81 - 117
1,1-Dichloroethane (1,1-DCA)	22.1	20.0	111	76 - 124
1,1-Dichloroethene (1,1-DCE)	22.1	20.0	110	67 - 119
1,2-Dichloroethane	22.5	20.0	112	72 - 130
1,2-Dichloropropane	21.4	20.0	107	83 - 119
n-Butanol	855	1010	85	49 - 182
2-Butanone (MEK)	20.7	20.0	103	60 - 133
2-Hexanone	20.7	20.0	104	61 - 131
4-Methyl-2-pentanone	22.4	20.0	112	61 - 132
Acetone	21.6	20.0	108	64 - 133
Benzene	21.7	20.0	109	78 - 118
Bromodichloromethane	22.8	20.0	114	79 - 123
Bromoform	24.4	20.0	122	69 - 126
Bromomethane	19.2	20.0	96	49 - 124
Carbon Disulfide	22.6	20.0	113	67 - 138
Carbon Tetrachloride	25.1	20.0	126	64 - 129
Chlorobenzene	21.3	20.0	107	80 - 121
Chloroethane	19.6	20.0	98	72 - 130
Chloroform	21.4	20.0	107	75 - 123
Chloromethane	17.8	20.0	89	55 - 139
Dibromochloromethane	23.4	20.0	117	78 - 127
Dichloromethane	20.4	20.0	102	73 - 122
Ethylbenzene	20.5	20.0	103	75 - 123
Styrene	20.3	20.0	101	80 - 121
Tetrachloroethene (PCE)	22.7	20.0	114	71 - 127
Toluene	21.9	20.0	109	77 - 120
Trichloroethene (TCE)	22.4	20.0	112	75 - 122
Vinyl Chloride	20.1	20.0	101	68 - 139
cis-1,2-Dichloroethene	20.6	20.0	103	77 - 123
cis-1,3-Dichloropropene	20.0	20.0	100	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/19/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 309793

Lab Control Sample
RQ1210886-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	42.8	40.0	107	77 - 124
n-Butyl Acetate	21.2	20.0	106	61 - 126
o-Xylene	21.0	20.0	105	77 - 131
trans-1,2-Dichloroethene	21.2	20.0	106	72 - 120
trans-1,3-Dichloropropene	21.1	20.0	106	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 310427

Analyte Name	Lab Control Sample RQ1211090-03			Duplicate Lab Control Sample RQ1211090-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	19.6	20.0	98	17.0	20.0	85	67 - 121	14	30
1,1,2,2-Tetrachloroethane	18.3	20.0	91	17.9	20.0	89	72 - 124	2	30
1,1,2-Trichloroethane	19.9	20.0	99	17.6	20.0	88	81 - 117	12	30
1,1-Dichloroethane (1,1-DCA)	20.7	20.0	104	18.0	20.0	90	76 - 124	14	30
1,1-Dichloroethene (1,1-DCE)	21.7	20.0	109	18.7	20.0	94	67 - 119	15	30
1,2-Dichloroethane	19.5	20.0	97	17.8	20.0	89	72 - 130	9	30
1,2-Dichloropropane	20.2	20.0	101	17.4	20.0	87	83 - 119	15	30
n-Butanol	796	1010	79	671	1010	67	49 - 182	17	30
2-Butanone (MEK)	20.5	20.0	102	17.3	20.0	86	60 - 133	17	30
2-Hexanone	20.4	20.0	102	18.0	20.0	90	61 - 131	12	30
4-Methyl-2-pentanone	19.5	20.0	98	17.4	20.0	87	61 - 132	12	30
Acetone	22.6	20.0	113	19.2	20.0	96	64 - 133	16	30
Benzene	19.6	20.0	98	17.6	20.0	88	78 - 118	11	30
Bromodichloromethane	18.2	20.0	91	16.5	20.0	82	79 - 123	10	30
Bromoform	19.2	20.0	96	17.1	20.0	85	69 - 126	12	30
Bromomethane	17.9	20.0	90	16.5	20.0	83	49 - 124	8	30
Carbon Disulfide	21.7	20.0	108	18.3	20.0	91	67 - 138	17	30
Carbon Tetrachloride	19.9	20.0	100	17.3	20.0	86	64 - 129	14	30
Chlorobenzene	19.6	20.0	98	17.6	20.0	88	80 - 121	11	30
Chloroethane	20.1	20.0	100	17.0	20.0	85	72 - 130	17	30
Chloroform	19.4	20.0	97	16.7	20.0	84	75 - 123	15	30
Chloromethane	18.8	20.0	94	15.9	20.0	79	55 - 139	17	30
Dibromochloromethane	19.3	20.0	97	17.3	20.0	86	78 - 127	11	30
Dichloromethane	19.5	20.0	98	17.6	20.0	88	73 - 122	10	30
Ethylbenzene	20.4	20.0	102	17.8	20.0	89	75 - 123	14	30
Styrene	18.8	20.0	94	17.5	20.0	87	80 - 121	7	30
Tetrachloroethene (PCE)	22.1	20.0	111	18.6	20.0	93	71 - 127	17	30
Toluene	19.3	20.0	97	17.8	20.0	89	77 - 120	8	30
Trichloroethene (TCE)	20.1	20.0	101	17.6	20.0	88	75 - 122	13	30
Vinyl Chloride	19.3	20.0	96	16.5	20.0	83	68 - 139	15	30
cis-1,2-Dichloroethene	20.0	20.0	100	17.6	20.0	88	77 - 123	13	30
cis-1,3-Dichloropropene	18.2	20.0	91	16.6	20.0	83	77 - 125	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036

Date Analyzed: 9/20/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg

Basis: Dry

Analysis Lot: 310427

Analyte Name	Lab Control Sample RQ1211090-03			Duplicate Lab Control Sample RQ1211090-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
m,p-Xylenes	40.2	40.0	101	36.3	40.0	91	77 - 124	10	30
n-Butyl Acetate	19.2	20.0	96	17.1	20.0	86	61 - 126	12	30
o-Xylene	20.0	20.0	100	17.6	20.0	88	77 - 131	13	30
trans-1,2-Dichloroethene	19.3	20.0	96	18.1	20.0	90	72 - 120	7	30
trans-1,3-Dichloropropene	18.1	20.0	91	15.7	20.0	78	69 - 127	14	30

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/20/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 310398

**Lab Control Sample
 RQ1211268-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	16.7	20.0	84	67 - 121
1,1,2,2-Tetrachloroethane	18.7	20.0	93	72 - 124
1,1,2-Trichloroethane	18.4	20.0	92	81 - 117
1,1-Dichloroethane (1,1-DCA)	16.4	20.0	82	76 - 124
1,1-Dichloroethene (1,1-DCE)	15.2	20.0	76	67 - 119
1,2-Dichloroethane	18.3	20.0	92	72 - 130
1,2-Dichloropropane	17.0	20.0	85	83 - 119
n-Butanol	731	1010	73	49 - 182
2-Butanone (MEK)	17.1	20.0	86	60 - 133
2-Hexanone	17.4	20.0	87	61 - 131
4-Methyl-2-pentanone	19.2	20.0	96	61 - 132
Acetone	15.1	20.0	75	64 - 133
Benzene	16.2	20.0	81	78 - 118
Bromodichloromethane	18.0	20.0	90	79 - 123
Bromoform	18.3	20.0	92	69 - 126
Bromomethane	17.7	20.0	89	49 - 124
Carbon Disulfide	19.5	20.0	98	67 - 138
Carbon Tetrachloride	17.6	20.0	88	64 - 129
Chlorobenzene	17.1	20.0	85	80 - 121
Chloroethane	14.5	20.0	73	72 - 130
Chloroform	17.3	20.0	87	75 - 123
Chloromethane	15.3	20.0	77	55 - 139
Dibromochloromethane	20.1	20.0	100	78 - 127
Dichloromethane	16.3	20.0	81	73 - 122
Ethylbenzene	16.9	20.0	85	75 - 123
Styrene	18.2	20.0	91	80 - 121
Tetrachloroethene (PCE)	17.2	20.0	86	71 - 127
Toluene	16.6	20.0	83	77 - 120
Trichloroethene (TCE)	17.2	20.0	86	75 - 122
Vinyl Chloride	15.7	20.0	79	68 - 139
cis-1,2-Dichloroethene	17.1	20.0	85	77 - 123
cis-1,3-Dichloropropene	17.5	20.0	88	77 - 125

Results flagged with an asterisk (*) indicate values outside control criteria.

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/20/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 310398

Lab Control Sample
RQ1211268-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	35.2	40.0	88	77 - 124
n-Butyl Acetate	18.5	20.0	92	61 - 126
o-Xylene	17.5	20.0	88	77 - 131
trans-1,2-Dichloroethene	16.3	20.0	81	72 - 120
trans-1,3-Dichloropropene	18.1	20.0	91	69 - 127

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/21/12

**Lab Control Sample Summary
 Volatile Organic Compounds by GC/MS**

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry

Analysis Lot: 310599

**Lab Control Sample
 RQ1211272-02**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	18.7	20.0	94	67 - 121
1,1,2,2-Tetrachloroethane	21.5	20.0	107	72 - 124
1,1,2-Trichloroethane	20.9	20.0	105	81 - 117
1,1-Dichloroethane (1,1-DCA)	18.9	20.0	94	76 - 124
1,1-Dichloroethene (1,1-DCE)	17.2	20.0	86	67 - 119
1,2-Dichloroethane	20.0	20.0	100	72 - 130
1,2-Dichloropropane	19.6	20.0	98	83 - 119
n-Butanol	784	1010	78	49 - 182
2-Butanone (MEK)	19.5	20.0	98	60 - 133
2-Hexanone	20.5	20.0	102	61 - 131
4-Methyl-2-pentanone	21.9	20.0	109	61 - 132
Acetone	17.0	20.0	85	64 - 133
Benzene	18.5	20.0	92	78 - 118
Bromodichloromethane	19.7	20.0	99	79 - 123
Bromoform	20.4	20.0	102	69 - 126
Bromomethane	17.0	20.0	85	49 - 124
Carbon Disulfide	20.7	20.0	103	67 - 138
Carbon Tetrachloride	18.9	20.0	94	64 - 129
Chlorobenzene	20.0	20.0	100	80 - 121
Chloroethane	16.4	20.0	82	72 - 130
Chloroform	19.4	20.0	97	75 - 123
Chloromethane	16.4	20.0	82	55 - 139
Dibromochloromethane	22.5	20.0	112	78 - 127
Dichloromethane	18.9	20.0	95	73 - 122
Ethylbenzene	19.5	20.0	98	75 - 123
Styrene	21.2	20.0	106	80 - 121
Tetrachloroethene (PCE)	19.7	20.0	98	71 - 127
Toluene	19.1	20.0	96	77 - 120
Trichloroethene (TCE)	19.2	20.0	96	75 - 122
Vinyl Chloride	17.4	20.0	87	68 - 139
cis-1,2-Dichloroethene	20.0	20.0	100	77 - 123
cis-1,3-Dichloropropene	20.3	20.0	101	77 - 125

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COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

QA/QC Report

Client: GeoSyntec Consultants
Project: ESTCP LC34 FO 0552B
Sample Matrix: Soil

Service Request: R1206036
Date Analyzed: 9/21/12

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Analytical Method: 8260C

Units: µg/Kg
Basis: Dry
Analysis Lot: 310599

Lab Control Sample
RQ1211272-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
m,p-Xylenes	40.6	40.0	102	77 - 124
n-Butyl Acetate	19.9	20.0	100	61 - 126
o-Xylene	20.4	20.0	102	77 - 131
trans-1,2-Dichloroethene	18.8	20.0	94	72 - 120
trans-1,3-Dichloropropene	20.6	20.0	103	69 - 127

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 3175

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 2 OF 2

Project Name: RESTCP LC34		Project Number: FO 0552B		ANALYSIS REQUESTED (Include Method Number and Container Preservative)			
Project Manager: Rebecca Daprano		Report CC		PRESERVATIVE			
Company/Address: GeoSyntec Titusville, FL		Email: rdaprano@geosyntec.com		METALS, DISOLVED (List in comments below)			
Phone #: (321) 269-5880		Sampler's Printed Name: David Sizemore		METALS TOTAL (List in comments below)			
Sampler's Signature: <i>[Signature]</i>		FOR OFFICE USE ONLY LAB ID		SAMPLING DATE		SAMPLING TIME	
CLIENT SAMPLE ID		DATE		TIME		MATRIX	
LC34-DPT0350-047.0-20120910		9/10/12		1450		Soil	
LC34-DPT0350-048.5-20120910		↓		1506		↓	
LC34-DPT0350-053.0-20120910		↓		1643		↓	
LC34-DPT0351-034.5-20120910		↓		1721		↓	
LC34-DPT0351-037.0-20120910		↓		1734		↓	
LC34-DPT0351-040.0-20120910		↓		1735		↓	
LC34-DPT0349-047.0-20120910		9/10/12		1809		↓	
LC34-DPT0351-045.5-20120911		9/11/12		913		↓	
LC34-DPT0351-047.0-20120911		↓		919		↓	
LC34-DPT0351-048.5-20120911		↓		929		↓	
LC34-DPT0351-053.0-20120911		↓		938		↓	
SPECIAL INSTRUCTIONS/COMMENTS Metals							
See QAPP <input type="checkbox"/>		STATE WHERE SAMPLES WERE COLLECTED: FL		RECEIVED BY: <i>[Signature]</i>		RELINQUISHED BY: <i>[Signature]</i>	
TURNAROUND REQUIREMENTS RUSH (SURCHARGES APPLY) 1 day ___ 2 day ___ 3 day ___ 4 day ___ 5 day ___		REPORT REQUIREMENTS I. Results Only ___ II. Results + OC Summaries (LCS, DUP, MS/MSD as required) <input checked="" type="checkbox"/> III. Results + OC and Calibration Summaries ___ IV. Data Validation Report with Raw Data ___		INVOICE INFORMATION PO # BILL TO:		INVOICE INFORMATION	
GCMS VOAS CLP GCMS SVAS GC VOAS PESTICIDES PCBS		GCMS VOAS CLP GCMS SVAS GC VOAS PESTICIDES PCBS		REQUSTED REPORT DATE STND		RECEIVED BY: <i>[Signature]</i>	
REMARKS/ALTERNATE DESCRIPTION		REMARKS/ALTERNATE DESCRIPTION		REMARKS/ALTERNATE DESCRIPTION		REMARKS/ALTERNATE DESCRIPTION	
Preservative Key 0. NONE 1. HCL 2. HNO3 3. H2SO4 4. NaOH 5. Zn Acetate 6. MeOH 7. NaHSO4 8. Other		Preservative Key 0. NONE 1. HCL 2. HNO3 3. H2SO4 4. NaOH 5. Zn Acetate 6. MeOH 7. NaHSO4 8. Other		Preservative Key 0. NONE 1. HCL 2. HNO3 3. H2SO4 4. NaOH 5. Zn Acetate 6. MeOH 7. NaHSO4 8. Other		Preservative Key 0. NONE 1. HCL 2. HNO3 3. H2SO4 4. NaOH 5. Zn Acetate 6. MeOH 7. NaHSO4 8. Other	

R1206036
GeoSyntec Consultants
ESTCP LC34 FO 0552B



Edata Yes
RELINQUISHED BY
Signature
Printed Name
Firm
Date/Time



CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 3176

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Project Name ESTCP LC34		Project Number FO0552B		ANALYSIS REQUESTED (Include Method Number and Container Preservative)	
Project Manager Rebecca Deprato		Report CC		PRESERVATIVE	
Company/Address GeoSyntec Consultants Titusville, FL				NUMBER OF CONTAINERS	
Phone # (321) 209 5860		Email rdprato@geosyntec.com		GC/MS VOAS • 8260 • 624 • CLP	
Sampler's Signature <i>[Signature]</i>		Sampler's Printed Name DAVID SEMON		GC/MS SVOKS • 8270 • 825	
CLIENT SAMPLE ID		FOR OFFICE USE ONLY LAB ID	DATE	SAMPLING TIME	MATRIX
LC34-DPT0349-037.0-20120910		20120910	9/10/12	1044	Soil
LC34-DPT0349-040.0-20120910		20120910		1047	
LC34-DPT0349-043.5-20120910		20120910		1103	
LC34-DPT0349-045.0-20120910		20120910		1107	
LC34-DPT0349-046.5-20120910		20120910		1133	
LC34-DPT0349-048.0-20120910		20120910		1136	
LC34-DPT0349-053.0-20120910		20120910		1148	
LC34-DPT0350-037.0-20120910		20120910		1352	
LC34-DPT0350-040.0-20120910		20120910		1411	
LC34-DPT0350-044.0-20120910		20120910		1418	
LC34-DPT0350-045.5-20120910		20120910		1441	
SPECIAL INSTRUCTIONS/COMMENTS Metals					
TURNAROUND REQUIREMENTS RUSH (SURCHARGES APPLY) 1 day _____ 2 day _____ 3 day _____ 4 day _____ 5 day _____		REPORT REQUIREMENTS I. Results Only _____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required) <input checked="" type="checkbox"/> III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____		INVOICE INFORMATION PO # _____ BILL TO: _____	
RECEIVED BY <i>[Signature]</i> Printed Name David Semon Firm GeoSyntec Date/Time 9/10/12		RECEIVED BY <i>[Signature]</i> Printed Name Amy Hentschke Firm ALS Date/Time 12/12/09		RELINQUISHED BY <i>[Signature]</i> Printed Name Amy Hentschke Firm ALS Date/Time 12/12/09	
STATE WHERE SAMPLES WERE COLLECTED FL		RECEIVED BY <i>[Signature]</i> Printed Name David Semon Firm GeoSyntec Date/Time 9/10/12		RELINQUISHED BY <i>[Signature]</i> Printed Name Amy Hentschke Firm ALS Date/Time 12/12/09	
See QAPP <input type="checkbox"/>		Requested Report Date 3/10/12		Edata <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
R1206036		R1206036		5	
GeoSyntec Consultant ESTCP LC34 FO 0652B		GeoSyntec Consultant ESTCP LC34 FO 0652B		GeoSyntec Consultant ESTCP LC34 FO 0652B	



Cooler Receipt and Preservation Check Form

Project/Client Geo.Syntec Folder Number R1206036

Cooler received on 9/12/12 by: AH COURIER: ALS UPS FEDEX VELOCITY CLIENT

- Were custody seals on outside of cooler? YES NO
 - Were custody papers properly filled out (ink, signed, etc.)? YES NO
 - Did all bottles arrive in good condition (unbroken)? YES NO
 - Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO N/A
 - Were Ice or Ice packs present? YES NO
 - Where did the bottles originate? ALS/ROC CLIENT
 - Temperature of cooler(s) upon receipt: 2.7°
- Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes
 If No, Explain Below No No No No No
 Date/Time Temperatures Taken: 9/12/12 1007

Thermometer ID: IR GUN#3 / IR GUN#4 .Reading From: Temp Blank / Sample Bottle

If out of Temperature, note packing/ice condition & Client Approval to Run Samples:

All Samples held in storage location	<u>R-002</u> by <u>AH</u> on <u>9/12/12</u> at <u>1013</u>
5035 samples placed in storage location	<u>F-005</u> by <u>AH</u> on <u>9/12/12</u> at <u>1013</u>

PC Secondary Review: AS 9/12/12

Cooler Breakdown: Date: 9/12/12 Time: 1428 by: AH

- Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO*
- Were correct containers used for the tests indicated? YES NO
- Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

pH	Reagent	Lot Received **		Exp	Sample ID	Vol. Added	Lot Added	Final pH
		YES	NO					
≥12	NaOH							
≤2	HNO ₃							
≤2	H ₂ SO ₄							
<4	NaHSO ₄							
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)				
	Na ₂ S ₂ O ₃	-	-					
	Zn Aceta	-	-					
	HCl	*	*					

Yes = All samples OK
 No = Samples were preserved at lab as listed
 PM OK to Adjust: _____

Bottle lot numbers: 062512-17
 Other Comments: _____

* Received DPT 351-43.5 not on CCC.

PC Secondary Review: AS 9/27/12
 H:\SMODOCS\Cooler Receipt 5.doc

*significant air bubbles: VOA > 5-6 mm ; WC -1 in. diameter